

# Innovative EC Systems: From E-Government to E-Learning, Knowledge Management, E-Health, and C2C Commerce

## Contents

<b>Opening Case: Compass Group Turns Managers into Detectives to Enhance E-Training</b> .....	137
5.1 <b>Digital Government: An Overview</b> .....	138
5.2 <b>E-Learning, E-Training, and E-Books</b> .....	144
5.3 <b>Knowledge Management, Intelligent Systems, and Robots</b> .....	151
5.4 <b>E-Health</b> .....	156
5.5 <b>Consumer-to-Consumer Electronic Commerce</b> .....	157
<b>Managerial Issues</b> .....	159
<b>Closing Case: Henry Ford Health System Provides Superior Patient Experience Using IT and E-Commerce</b> .....	162
<b>References</b> .....	162

## Learning Objectives

Upon completion of this chapter, you will be able to:

1. Describe various e-government initiatives.
2. Describe e-government activities and implementation issues including government 2.0 and m-government.
3. Describe e-learning, virtual universities, and e-training.
4. Describe e-books and their readers.
5. Describe knowledge management and dissemination as e-commerce.
6. Describe and discuss online advisory systems.
7. Describe e-health.
8. Describe C2C activities in e-commerce.

---

## OPENING CASE: COMPASS GROUP TURNS MANAGERS INTO DETECTIVES TO ENHANCE E-TRAINING

Compass Group ([compass-group.com](http://compass-group.com)) is a UK-based major provider of food and support services worldwide with 470,000 employees in 52 countries. The support services include security, janitorial services, building operations and maintenance, and project management. (See [compass-group.com/Support-Services-wwd.htm](http://compass-group.com/Support-Services-wwd.htm) and [compass-group.com/about-us.htm](http://compass-group.com/about-us.htm).) The company has over 10,000 client sites (2016).

## The Problem

The company's regional managers used financial performance software to analyze trends and review statistical data available in financial statements related to their functional areas. By defining the causes of problems and explaining unusual financial deviations from budgets, corrections could be planned. However, the company found that the managers had difficulty using the software. Therefore, Compass Group

---

**Electronic supplementary material:** The online version of this chapter (doi:[10.1007/978-3-319-50091-1\\_5](https://doi.org/10.1007/978-3-319-50091-1_5)) contains supplementary material, which is available to authorized users.

decided to partner with City & Guilds Kineo to train the managers using the financial software from Kineo Learning Solutions ([kineo.com/solutions](http://kineo.com/solutions)). However, some managers were skeptical about e-training (an application of e-learning), so in order to alleviate concerns and secure collaboration and use, it was necessary to convince them of the program's usefulness.

## The Solution

To train the regional managers, Compass Group decided to use an attractive approach that would enable rapid mass training at low cost. They decided on e-training.

The implementation team created the "Compass Detective Board Game." The participating managers played the role of "detectives" in the game. Each detective needed to analyze performance and find solutions to problems ("crimes"). Each player had an adaptation to her/his functional area, based on real-life situations. The players received assistance in problem-solving so they could gain experience. The players were able to come up with answers to questions such as how to react to a price cut by a competitor or how to determine when a budget deviation is significant. (Read the case study at [kineo.com/case-studies/process-and-technical/compass-group-systems-training](http://kineo.com/case-studies/process-and-technical/compass-group-systems-training).)

## The Results

In the first 6 months of its existence, the project had some outstanding successes:

- *Improved perceived performance:* Most participants agreed that their performance was likely to improve, thanks to the training.
- *Train large numbers of people, quickly:* The e-learning enabled training many more managers rather than using conventional training (at the same cost and time frame).
- *Cost reduction:* The Compass Group saved £495,000 in 6 months, compared with the costs for conventional training.

**Sources:** Based on City & Guilds Kineo (2011), Training Press Releases (2011), [compass-group.com](http://compass-group.com), and [en.wikipedia.org/wiki/Compass\\_Group](http://en.wikipedia.org/wiki/Compass_Group) (both accessed March 2016).

## LESSONS LEARNED FROM THE CASE

E-learning (and e-training) is an EC application that helps organizations electronically teach a large number of students or employees, who are frequently in different locations, to ensure that they can grow and handle their jobs effectively. E-training at Compass Group is based in part on making sure that employees know why training is important to their business, clients, and customers. By creating an e-training program that engaged the trainees, the company not only reduced training costs and successfully trained the employees, it also motivated many employees to embrace e-training. E-learning and e-training are major topics in this chapter. Other innovative systems described in this chapter are e-government, e-books, knowledge management, e-health, and consumer-to-consumer EC.

## 5.1 DIGITAL GOVERNMENT: AN OVERVIEW

Electronic government, also known as *e-government* or *digital government*, is a growing e-commerce application area that encompasses many topics. The area's major objective is to bring public sector institutions into the digital age. For an overview, see Brown et al. (2014). This section presents the major ones.

### Definition and Scope

**E-government** refers to the use of information technology in general, and e-commerce in particular, to improve the delivery of government services and activities in the public sector, such as providing citizens with more convenient access to information and services, and providing effective delivery of government services to citizens and businesses as well as improving the performance of government employees. It also is an efficient and effective way for governments to interact with citizens, businesses, and other entities and to improve governmental business transactions (such as buying and selling goods and services), and to operate effectively within the governments themselves. E-government includes a large number of activities, as can be seen in the New Zealand case (Online File W5.1) and in [en.wikipedia.org/wiki/E-Government](http://en.wikipedia.org/wiki/E-Government). For details, see Shark and Toporkoff (2008). For resources, see [w3.org/egov](http://w3.org/egov).

**Table 5.1** Representative categories of e-government performance objectives

G2C	G2B
<ul style="list-style-type: none"> <li>Reduce the time needed to interact with the government</li> </ul>	<ul style="list-style-type: none"> <li>Increase the ability for businesses to find, view, and comment on rules and regulations</li> </ul>
<ul style="list-style-type: none"> <li>Create a friendly single point of access to government services for individuals</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the burden on businesses by enabling online filing of taxes and other documents</li> </ul>
<ul style="list-style-type: none"> <li>Reduce the time spent in finding federal jobs</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the time to fill out export forms and locate related information</li> </ul>
<ul style="list-style-type: none"> <li>Reduce the average time for citizens to find benefits and determine eligibility</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the time for businesses to comply with government regulations</li> </ul>
<ul style="list-style-type: none"> <li>Increase the number of citizens who use the Internet to find information on recreational opportunities</li> </ul>	
<ul style="list-style-type: none"> <li>Meet the high public demand for information</li> </ul>	
<ul style="list-style-type: none"> <li>Improve the value of government services to its citizens</li> </ul>	
<ul style="list-style-type: none"> <li>Expand access to information for people with disabilities</li> </ul>	
<ul style="list-style-type: none"> <li>Make obtaining financial assistance from the government easier, cheaper, quicker, and more comprehensible</li> </ul>	
G2G	IEE
<ul style="list-style-type: none"> <li>Decrease time needed to respond to emergency incidents by government agencies</li> </ul>	<ul style="list-style-type: none"> <li>Increase availability of training programs for government employees</li> </ul>
<ul style="list-style-type: none"> <li>Reduce the time to verify public records</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the average time to process clearance forms</li> </ul>
<ul style="list-style-type: none"> <li>Increase the number of grant programs available for electronic applications</li> </ul>	<ul style="list-style-type: none"> <li>Increase use of e-travel services within each agency</li> </ul>
<ul style="list-style-type: none"> <li>Increase efficiency of communication between federal, state, local, and tribal governments</li> </ul>	<ul style="list-style-type: none"> <li>Reduce time and overhead costs to purchase goods and services throughout the federal government</li> </ul>
<ul style="list-style-type: none"> <li>Improve collaboration with foreign partners, including governments and institutions</li> </ul>	<ul style="list-style-type: none"> <li>Plan IT investments more effectively</li> </ul>
<ul style="list-style-type: none"> <li>Automate internal processes to reduce costs within the federal government by disseminating the best practices across agencies</li> </ul>	<ul style="list-style-type: none"> <li>Secure better services at a lower cost</li> </ul>
	<ul style="list-style-type: none"> <li>Cut government operating costs</li> </ul>

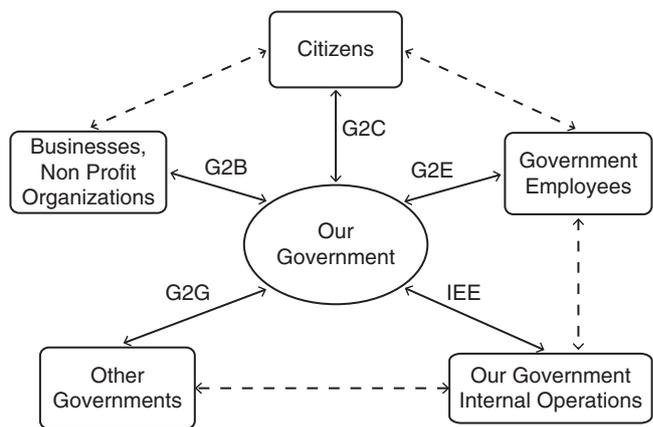
Sources: Based on Egov (2003) and the authors' experience

Note that e-government also offers an opportunity to improve the efficiency and effectiveness of the internal operation of a government.

E-government includes the following major categories: government-to-citizens (G2C), government-to-business (G2B), government-to-government (G2G), internal efficiency and effectiveness (IEE), and government-to-employees (G2E). The major activities of the first four categories are provided in Table 5.1 (also see Digital Government Strategy 2012 and Egov 2003). For a description of the range of e-government activities in the United States, see Digital Government Strategy (2012) and [whitehouse.gov/omb/e-gov](http://whitehouse.gov/omb/e-gov). Of special interest is the recent document title “Digital Government” ([whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.htm](http://whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.htm)). For examples of e-government in Singapore, see [egov.gov.sg](http://egov.gov.sg).

**Example: The European Commission**

The European Commission’s Digital Agenda website ([ec.europa.eu/digital-agenda/welcome-digital-agenda](http://ec.europa.eu/digital-agenda/welcome-digital-agenda)) is an example of a comprehensive e-government system. It is one of the European Union’s seven flagships for achieving its 10-year growth strategy. The site is divided into several topics—notably, life and work, public services, ongoing studies,



**Figure 5.1** E-government categories of activities

smart cities, and e-health and aging. For details, see [ec.europa.eu/digital-agenda/welcome-digital-agenda](http://ec.europa.eu/digital-agenda/welcome-digital-agenda).

The above categories are based on different entities with whom the government is interacting. However, these entities are also interconnected, as shown in the broken lines of Figure 5.1.

The following is a brief description of the major activities conducted between the government and each major entity.

## Government-to-Citizens

The **government-to-citizens (G2C)** category includes all the interactions between a government and its citizens that take place electronically. G2C can involve dozens of different initiatives. The basic idea is to enable citizens to interact electronically with the government from anywhere and at anytime. G2C applications enable citizens to ask questions of government agencies and receive answers, pay taxes, receive payments and documents, and schedule services, such as employment interviews and medical appointments. For example, in many U.S. states, residents can renew driver's licenses, pay traffic tickets, and make appointments for vehicle emission inspections and driving tests—all online.

The major features of government websites are: information on how to contact the government, public notices to citizens, links to other sites, educational material, publications, statistics, legal notes, and databases. The major areas of such G2C activities are social services, tourism and recreation, public safety, research and education, downloadable forms, discovery of government services, tax filing, information about public policy, and advice about health and safety issues. G2C is now available on mobile/wireless devices in many countries and local governments.

Another area of G2C activity takes place by solving citizens' problems. The government (or a politician) can use CRM-type software to assign inquiries and problem cases to appropriate staff members (as shown on [ict.govt.nz](http://ict.govt.nz)). Subsequently, workflow CRM software can be used to track the progress of the problems' resolution.

Note that over 20 countries block some websites for political, social, or other reasons (e.g., China, North Korea, Iran, Syria). For more on G2C, see [usa.gov/Citizen/Topics/All-Topics.shtml](http://usa.gov/Citizen/Topics/All-Topics.shtml). For an overview of major citizens' groups and the services provided to them by the U.S. Department of Labor, see [dol.gov/\\_sec/e\\_government\\_plan/p41-43\\_appendix.htm](http://dol.gov/_sec/e_government_plan/p41-43_appendix.htm).

Two popular examples of G2C are provided next.

### Electronic Voting

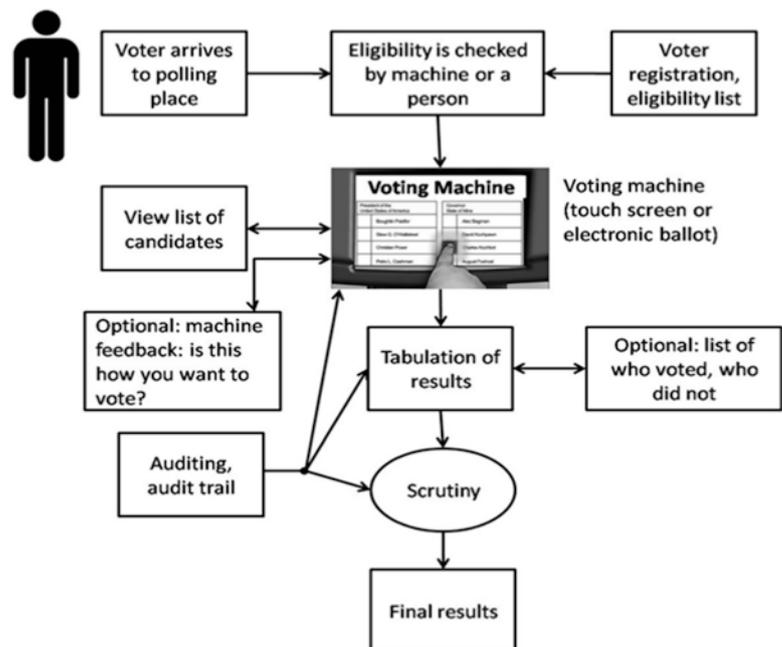
Voting processes may be subject to errors, manipulation, and fraud. In many countries, there are attempts to “rig” the votes; in others, the losers want a recount. Voting may result in major political crises, as has happened in several countries. Problems with the U.S. 2000 and 2004 presidential elections have accelerated the trend toward electronic voting.

The voting process encompasses a broad spectrum of technological and social activities from voter registration and voter authentication to the casting of ballots and subsequent tallying of results. For an example of this process, see Figure 5.2. Electronic voting automates some or all steps in the process.

Fully electronic voting systems have raised considerable controversy because of a variety of relevant factors, such as the proprietary nature of the software. Typical issues are the difficulties in selling the systems to voters, complex auditing, and the lack of experience in some steps of the process.

Note: A debatable issue is the possibility of fraud in electronic voting (Madden 2015).

**Figure 5.2** The process of using a voting machine



For more information on e-voting, see [en.wikipedia.org/wiki/Electronic\\_voting](https://en.wikipedia.org/wiki/Electronic_voting) and the Electronic Frontier Foundation ([eff.org](https://eff.org)).

### **Electronic Benefits Transfer**

One e-government application that is not new is the electronic benefits transfer (EBT). It has been available since the early 1990s and is now in use in many countries. The U.S. government transfers billions of dollars in benefits to many of its citizens on a regular basis. Beginning in 1993, an attempt was made to deliver benefits to recipients' bank accounts. However, more than 20% of payments go to citizens who do not have a bank account. To solve this problem, the government initiated the use of smart cards (see Chapter 11). Benefit recipients can load the money they receive onto the cards and use the cards at automated teller machines (ATMs), point-of-sale locations, and grocery and other stores, just like other prepaid value cards. The advantage is not only the reduction in processing costs (from about 50¢ per paper check to 2¢ for electronic payment) but also the reduction of fraud. With biometrics (see Chapter 10) coming to smart cards and PCs, officials expect a substantial reduction in fraud. EBT has been implemented in all states since 2004. For more information on EBT in government, see [fns.usda.gov/eft/general-electronic-benefit-transfer-ebt-information](https://fns.usda.gov/eft/general-electronic-benefit-transfer-ebt-information).

In several developing countries (e.g., India, Brazil), governments are using mobile payments to transfer benefits to citizens.

### **Government-to-Business**

Governments seek to automate their interactions with businesses. Although we call this category **government-to-business (G2B)**, the relationship works two ways: government-to-business and business-to-government. Thus, G2B refers to activities where the government sells products to businesses or provides businesses with services and vice versa. Two key G2B activities are e-procurement and the auctioning of government surpluses. For other U.S. G2B initiatives for businesses and nonprofits, see [usa.gov/Business/Business-Gateway.shtml](https://usa.gov/Business/Business-Gateway.shtml).

### **Government E-Procurement**

Governments buy large amounts of MROs (maintenance, repair, and operations; Chapter 4) and other materials directly from suppliers. In many cases, RFQ (or tendering) systems are mandated by law. For years, these RFQs were done manually; the systems are now moving online. These systems utilize reverse (buy-side) auction systems, such as those described in Chapter 4. Governments provide all the support for such tendering systems. For additional information about such reverse auctions, see GSA Auctions ([gsaauctions.gov](https://gsaauctions.gov)). For an over-

view of and to watch a video about GSA auctions, see [gsa.gov/portal/content/100747?utm\\_source=FAS&utm\\_medium=print-radio&utm\\_term=gsaauctions&utm\\_campaign=shortcuts](https://gsa.gov/portal/content/100747?utm_source=FAS&utm_medium=print-radio&utm_term=gsaauctions&utm_campaign=shortcuts). In the United States, for example, the local housing agencies of HUD (Housing and Urban Development), which provides housing to low-income residents, are moving to e-procurement.

#### **Example 1: Procurement at GSA**

The U.S. General Services Administration ([gsa.gov](https://gsa.gov)) uses technologies such as demand aggregation and reverse auctions to buy items for various units of the federal government (see also [governmentauctions.org](https://governmentauctions.org) and [liquidation.com](https://liquidation.com)).

#### **Example 2: The U.S. SBA**

The Procurement Marketing and Access Network of the Small Business Administration ([sba.gov](https://sba.gov)) has developed a service called PRO-Net ([pro-net.sba.gov](https://pro-net.sba.gov)). It is a searchable database that contracting officers in various U.S. government units can use to find products and services sold by small, disadvantaged businesses, or businesses owned by women.

### **Group Purchasing**

Many government agencies also utilize online group purchasing, which was described in Chapters 3 and 4. A related aspect is *quantity discount*, where suppliers post prices that get lower as quantities of orders increase. A similar method occurs when government buyers initiate group purchasing by posting product requests that other buyers may review and then join the group(s).

### **Forward and Reverse E-Auctions**

Many governments auction equipment surpluses or other goods, ranging from vehicles to foreclosed real estate. These auctions are now moving to the Internet. Governments can auction from a government website or they can use third-party auction sites such as [ebay.com](https://ebay.com), [bid4assets.com](https://bid4assets.com), or [governmentauctions.org](https://governmentauctions.org). The U.S. General Services Administration (GSA) in the United States operates a property auction site online (see [gsaauctions.gov](https://gsaauctions.gov)), where real-time auctions for surplus and seized goods are conducted. Some of these auctions are restricted to dealers; others are open to the public (see [governmentauctions.org](https://governmentauctions.org)). More common is the use of reverse auctions for purchasing goods and services, as described in Chapter 4.

### **Government-to-Government**

The **government-to-government (G2G)** category consists of EC activities between different units of governments, including those within one governmental body. Many of these are aimed at improving the effectiveness and the

efficiency of government operations. Here is a G2G example from the United States:

- **Intelink.** Intelink ([intelink.gov](http://intelink.gov)) is an intranet that contains classified information that is shared by the numerous U.S. intelligence agencies. It is a U.S. Government computer system that is provided only for authorized U.S. government use.

## Government-to-Employees and Internal Efficiency and Effectiveness

Governments are introducing various EC initiatives internally. Two areas are illustrated next.

### Government-to-Employees (G2E)

Governments are just as interested, as private sector organizations are, in providing services and information electronically to their employees. **Government-to-employees (G2E)** applications refer to e-commerce activities between the government and its employees. Such activities may be especially useful in enabling efficient e-training of new employees, e-learning for upgrading skills and communication and collaboration activities. Other typical services are: e-payroll, e-human resources management, and e-recruiting.

Examples of G2E services are provided in Online File W.5.1.

### Internal Efficiency and Effectiveness (IEE)

Governments have to improve the efficiency and effectiveness of their operations in order to stay within their budgets and avoid criticism. Unfortunately, not all governments (or units within governments) are efficient or effective. Automation, including e-commerce, provides an opportunity to significantly improve operations.

The following example illustrates some e-commerce applications for improving IEE.

#### Example

The U.S. Office of Management and Budget (OMB) ([whitehouse.gov/omb](http://whitehouse.gov/omb)) provides a list of activities related to IEE in their FY 2011 “Report to Congress” (see Office of Management and Budget 2012).

This list includes topics such as:

- Federal Cloud Computing Program Management
- Innovative Wireless and Mobile Apps Platform
- FedSpace (a collaborative platform for Federal employees)
- Federal Data Center Consolidation Initiative
- Small Business Dashboard

- IT Dashboard (also available via mobile devices)
- Performance.gov (a website with information about performance improvement activities)

In addition, there are traditional IEE-related initiatives such as e-payroll, e-record management, e-training, integrated acquisition, and e-HRM.

## Implementing E-Government

Like most other organizations, government entities want to become digital. Therefore, one can find a large number of EC applications in government organizations. For many practices and examples, see Mei Hua and Rohman (2015), Wohlers and Bernier (2016), and the government innovators network at [innovations.harvard.edu](http://innovations.harvard.edu).

This section examines some of the trends and issues involved in implementing e-government (see Chan et al. 2011 for an overview). Note that one of the major implementation inhibitors is the desire of many governments to maintain control over the use and dissemination of data and knowledge.

## The Transformation to E-Government

The transformation from traditional delivery of government services to full implementation of e-government may be a lengthy process. The business consulting firm Deloitte and Touche conducted a study that identified six stages in the transformation from traditional to e-government. These stages do not have to be sequential, but frequently are, with a seventh stage added by the authors, as shown in Online File W5.2.

All major software companies provide tools and solutions for conducting e-government. One example is Cognos (an IBM Company; see [ibm.com/software/analytics/cognos](http://ibm.com/software/analytics/cognos)). The company also provides free white papers.

## E-Government 2.0 and Social Networking

By employing social media tools, new business models, and embracing social networks and user participation, government agencies can raise the effectiveness of their online activities to meet users’ needs at a reasonable cost. Such initiatives are referred to as **Government 2.0**. For extensive coverage of content and applications of this topic, see Imholt (2015) and Grogan (2015). Government agencies around the world are now experimenting with social media tools as well as with their own pages and presence on public social

network sites. Governments are using Web 2.0 tools mainly for collaboration, dissemination of information, e-learning, and citizen engagement.

### Example

The U.S. Coast Guard uses YouTube, Twitter, and Flickr to disseminate information and discuss their rescue operations. Notable is FEMA's Twitter feed (previously "FEMA in Focus"), a channel that provides dissemination of FEMA-related information (see [twitter.com/fema](https://twitter.com/fema)). Law enforcement agencies use social media (such as Facebook and Twitter) to hunt for criminals. (For some examples, see [digitaltrends.com/social-media/the-new-inside-source-for-police-forces-social-networks](http://digitaltrends.com/social-media/the-new-inside-source-for-police-forces-social-networks).) For more on how government agencies are expanding their use of social media, see [federalnewsradio.com/445/3547907/Agencies-open-the-door-to-innovative-uses-of-social-media](http://federalnewsradio.com/445/3547907/Agencies-open-the-door-to-innovative-uses-of-social-media). For more examples, see Grogan (2015).

### The Potential of E-Government 2.0

Many governments are embarking on government 2.0 initiatives. Several examples are provided in Online File W.5.1.

For an extensive list of resources on social networks in governments, including reports, applications, and policies, see [adobe.com/solutions/government.html?romoid=DJHAZ](http://adobe.com/solutions/government.html?romoid=DJHAZ). For extensive coverage of e-government, see [wisegeek.com/what-is-e-government.htm](http://wisegeek.com/what-is-e-government.htm).

## M-Government

**Mobile government (m-government)** is the implementation of e-government applications using wireless platforms and mobile devices, especially smartphones. It is done mostly in G2C (e.g., see Government of Canada Wireless Portal; [mgovworld.org](http://mgovworld.org)). M-government uses wireless Internet infrastructure and devices. It is a value-added service, because it enables governments to reach a larger number of citizens (e.g., via smartphone or Twitter) and it can be more cost-effective than wireline-based EC platforms. It is very useful in disasters (e.g., emergency notifications), is fast (e.g., in conducting surveys and polls), and it is convenient for citizens as well. In addition, governments employ large numbers of mobile workers who are supported by wireless devices.

### Example: Public Buses in Honolulu

An example of a mobile government project is the city government-run bus location system (an app) in Honolulu, Hawaii called "DaBus" ([honolulu.gov/mobile](http://honolulu.gov/mobile)). Using your cell phone, you can find the estimated arrival time of any of the buses at more than 4000 bus stops. Buses are equipped with GPS devices (Chapter 6) that transmit the bus's location

in real time. The system then calculates the estimated arrival time for each stop. Similar systems exist in many other places (e.g., in Singapore "IRIS," in the USA "NextBus," and in the UK "JourneyPlanner" apps).

M-government can help make public information and government services available anytime and anywhere. See [usa.gov/mobileapps.shtml](http://usa.gov/mobileapps.shtml). A specific example of m-government would be texting a mass alert to the public in the event of a major disaster.

### The Benefits of M-Government

The major benefits of m-government are:

- More citizens and employees can be reached (anyplace, anytime).
- Cost reduction (e.g., by increasing productivity of employees; reduced budgets).
- Modernizing the operations of the government (e.g., employ mobile devices).
- Employees can bring their own mobile devices to work, saving hardware and software costs.
- Providing quality, flexible services to the public.
- Increasing the reach and speed for public dissemination of information.

In addition, many of the generic benefits of m-commerce (Chapter 6) are valid in m-government too.

### Some Implementation Issues

Representative issues of implementing m-government are:

- An expensive infrastructure may be needed to supplement the existing traditional infrastructure. More infrastructures are needed for the wireless systems as well as for the increased volume of information flow (see the closing case in this chapter).
- It may be difficult to maintain security and privacy of information on public mobile networks.
- For many citizens, mobile devices are too small or complex to use.
- In many countries there is a lack of standards and legislation regarding the use of data delivered wirelessly.

---

## SECTION 5.1 REVIEW QUESTIONS

1. Define e-government.
2. What are the four major categories of e-government services?
3. Describe G2C.

4. Describe how e-voting works.
5. Describe the two main areas of G2B activities.
6. How does government use EC internally and when dealing with other governments?
7. Describe e-government social networking activities. What are some potential benefits?
8. Describe m-government and its implementation issues.

## 5.2 E-LEARNING, E-TRAINING, AND E-BOOKS

The topic of e-learning is gaining much attention, especially because that even first-rate universities such as MIT, Harvard, and Stanford in the United States and Oxford in the United Kingdom are implementing it. Figure 5.3 shows the forces that are driving the transition from traditional education to online learning. E-learning also is growing as a method for training and knowledge creation in the business world and is becoming a major e-business activity. In this section, we will discuss several topics related to e-learning.

### The Basics of E-Learning: Definitions and Concepts

There are several definitions of e-learning. A working definition of **e-learning** is the use of online delivery of educational materials and methods, using information technologies, for the purposes of learning, teaching, training, or gaining knowledge at anytime, and at many different locations (see

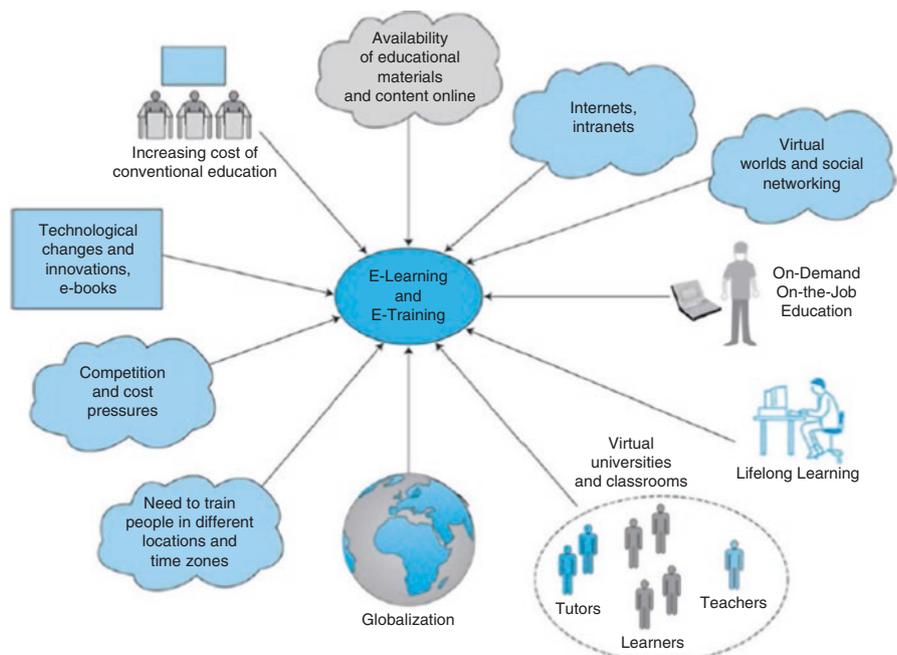
[people.howstuffworks.com/elearning1.htm](http://people.howstuffworks.com/elearning1.htm), [en.wikipedia.org/wiki/E-learning](http://en.wikipedia.org/wiki/E-learning), and [webopedia.com/TERM/E/e\\_learning.html](http://webopedia.com/TERM/E/e_learning.html)).

E-learning is broader than the term *online learning*, which generally refers exclusively to Web-based learning. E-learning includes *m-learning* (or *mobile learning*) that is used when the material is delivered wirelessly to smartphones, tablets, or other mobile devices (description to follow). E-learning is synonymous with *computer-based instruction*, *computer-based training*, *online education*, and other terms.

It appears in a variety of electronically supported learning and teaching activities, ranging from virtual classrooms to mobile conferences. E-learning includes a variety of methods of computer-facilitated learning ranging from self-study with DVDs to online degrees offered by universities. E-learning may also include the use of Web-based teaching materials and hypermedia, multimedia CD-ROMs, learning and teaching portals, discussion boards, collaborative software, e-mail, blogs, wikis, chat rooms, computer-aided assessments, educational animation, simulations, games, learning management software, and more.

An interesting school without classrooms is the Hellerup School in Denmark. Students there “learn by doing” and even determine the best way they can learn. For how the school operates, see [theglobeandmail.com/report-on-business/economy/canada-competes/no-classrooms-and-lots-of-technology-a-danish-schools-approach/article12688441](http://theglobeandmail.com/report-on-business/economy/canada-competes/no-classrooms-and-lots-of-technology-a-danish-schools-approach/article12688441) and Millar (2013). For more on e-learning, see [en.wikipedia.org/wiki/E-learning](http://en.wikipedia.org/wiki/E-learning). For a community and resources for e-learning professionals, see [elearningguild.com](http://elearningguild.com).

**Figure 5.3** The drivers of e-learning



## M-Learning

A special category of e-learning is **m-learning**, or mobile learning, which refers to e-learning or other forms of education using mobile devices. Thus, one can learn at any place where a mobile device works. M-learning deals with communication and teaching in wireless environments. Special attention is given to situations where the instructors and the teaching materials are mobile. This technology enables learners to work and collaborate more easily than in off-line situations. An example is MobileLearn ([waldenu.edu/experience/learning/mobilelearn](http://waldenu.edu/experience/learning/mobilelearn)), an online learning program offered by Walden University ([waldenu.edu](http://waldenu.edu)), an online university that extensively uses m-learning. Some off-line universities are using mobile learning as well. One such university is Abilene Christian University ([acu.edu](http://acu.edu)); faculty are focused on using tablets for learning and teaching (see [acu.edu/technology/mobilelearning](http://acu.edu/technology/mobilelearning)). For further details including case studies and resources, see [m-learning.org](http://m-learning.org) and [en.wikipedia.org/wiki/M-learning](http://en.wikipedia.org/wiki/M-learning). See also a slide presentation titled “What is M-Learning” at [slideshare.net/aurionlearning/what-is-mllearning](http://slideshare.net/aurionlearning/what-is-mllearning).

## Benefits and Drawbacks of E-Learning

E-learning has many benefits both to the teaching institutions and to the learners. However, it also has several drawbacks, thus making it a controversial topic.

### Benefits of E-Learning

In the Internet age, skills and knowledge need to be *continually updated* and refreshed (lifetime learning) to keep up with today’s fast-paced business and technological changes. This means that more people need to learn and frequently do so in nontraditional ways. E-learning supports such learning due to the following capabilities and benefits.

- **Education.** Students can learn at home and keep their regular jobs while in school. Busy homemakers can earn degrees.
- **Learning and training time reduction.** E-learning can expedite training time by up to 50%.
- **Cost reduction.** The cost of providing a learning experience can be reduced by 50–70% when classroom lectures are replaced by e-learning sessions. This includes reduced faculty cost, no classrooms, and less or no travel time.

- **Large number and diversity of learners.** E-learning can provide training to a large number of people from diverse cultural backgrounds and educational levels, even though they are at different locations in different time zones. Large companies such as Cisco Systems, Inc. ([cisco.com](http://cisco.com)) provide online training courses to a large number of employees, customers, and business partners.
- **Innovative teaching.** Ability to provide innovative teaching methods such as special engagements, interaction with experts, interaction with learners in other countries, and so forth.
- **Measurement and assessment of progress.** Ability to assess progress in real time, find areas of difficulties, and design remedial work.
- **Self-paced and motivation learning.** E-learning students usually are self-paced and self-motivated. These characteristics may result in higher content retention (25–60% higher than with traditional lecture-based training).
- **Richness and quality.** E-learning enables the use of top instructors as well as employing rich multimedia support. This may make learning more enjoyable. Difficult content can be made interesting and easy to understand. Overall, the quality of learning may increase.
- **Flexibility.** E-learners are able to adjust the time, location, content, and speed of learning according to their own personal schedules.
- **Updated and consistent teaching material.** It is almost impossible to economically update the information in textbooks more frequently than every 2 or 3 years; e-learning can offer real-time access to the most updated knowledge. Delivery of e-learning may be more consistent than that of material presented in traditional classroom learning, because variations among teachers and teaching materials are minimized.
- **Ability to learn from mobile devices.** This helps learning in any place and at anytime as well as providing support to learners by teachers and peers.
- **Expert knowledge.** In contrast with the knowledge of a single instructor in the classroom, e-learning may include the knowledge of several experts, each of whom prepares a teaching module in his or her area of expertise.
- **Fear-free environment.** E-learning can facilitate learning for students who may not wish to join a face-to-face group discussion to interact with peers or teachers.

E-learning can be very useful in developing countries. For an example of positive results in Jamaica, see Thompson (2014). For the top ten e-learning statistics in 2014 with an infographic, see [elearningindustry.com/top-10-e-learning-statistics-for-2014-you-need-to-know](http://elearningindustry.com/top-10-e-learning-statistics-for-2014-you-need-to-know). For how to teach with e-learning including the design of material, see Clark and Mayer (2016).

### **Drawbacks and Challenges of E-Learning**

Despite the numerous benefits for both the learners and the teaching organizations, e-learning does have some drawbacks, such as the following:

- **Need for instructor retraining.** Some instructors do not have the knowledge to teach by electronic means and may require training, which costs money.
- **Equipment needs and support services.** Additional funds are needed (by the teaching institute) to purchase e-learning systems that supplement traditional ones. These are needed for e-learning creation, use, and maintenance.
- **Lack of face-to-face interaction and campus lifestyle.** Many feel that the intellectual stimulation that takes place through interaction in a classroom with “live” instructors and peers cannot fully be replicated with e-learning.
- **Assessments and examinations.** In the higher education environment, one criticism is that professors may not be able to adequately assess student work completed through e-learning. There is no way of knowing, for example, who actually completed the assignments or exams. (Nevertheless, the same is true for any homework done outside the classroom).
- **Maintenance and updating.** Although e-learning materials are easier to update than traditionally published materials, there are practical difficulties (e.g., cost, instructors’ time) in keeping e-learning materials current. The content of e-learning material can be difficult to maintain due to the lack of ownership of, and accountability for, website material. The developers of online content might not be those who update it.
- **Need for reliable wireline and wireless communication networks and devices.** Privacy needs to be protected as well as systems need to be secured.
- **Protection of intellectual property.** It is difficult and expensive to control the transmission of copyrighted works downloaded from the e-learning platform.
- **Student retention.** Without some human feedback and intervention, it may be difficult to keep certain students engaged and energetic.

The top constraints for corporate e-learning are: (1) too costly to create and maintain; (2) difficulties persuading people to learn in new ways; (3) insufficient technological support; (4) employee hesitation to contribute to social learning; and (5) learners may prefer traditional classroom instruction.

Advanced technologies can reduce some of the above and other drawbacks and constraints. For example, some online software products have features that help stimulate student thinking. Biometric controls can be used to verify the identity of students who are taking examinations from a distance. However, these features add to the costs of e-learning.

For more about the disadvantages of e-learning, see [peoplelearn.homestead.com/ELearning/Introduction/Disadvantages.html](http://peoplelearn.homestead.com/ELearning/Introduction/Disadvantages.html).

### **Distance Learning and Online Universities**

The term **distance learning**, also known as *distance education*, refers to education where the teacher and students are in different locations. In such a case, the student is separated from a classroom by distance and possibly time. Sometimes students meet once or twice at a physical location in order to get to know each other, meet the instructor or coordinator, or take examinations. Distance learning is becoming widely used in universities and learning institutions around the globe. Major universities offer courses and degrees via this mode, which is becoming more recognized and acceptable. For details, see [onlineeducation.net](http://onlineeducation.net).

#### **Virtual Universities—Real Degrees**

The concept of **virtual universities**, online universities where students take classes from home via the Internet, is expanding rapidly. Hundreds of thousands of students in many countries, from the United Kingdom to Israel to Thailand, are taking online classes. A large number of existing universities, including Stanford University and other top-tier universities, offer online education of some form; for example, MIT offers thousands of their courses online (see courses at [ocw.mit.edu](http://ocw.mit.edu)). Millions of independent learners from all over the world (students, professors, self-learners) log on to the MIT OpenCourseWare site each year (see [ocw.mit.edu/about](http://ocw.mit.edu/about) and [ocw.mit.edu/about/site-statistics](http://ocw.mit.edu/about/site-statistics)). Some universities, such as University of Phoenix ([phoenix.edu](http://phoenix.edu)), National University ([nu.edu](http://nu.edu)), and the University of Maryland ([umuc.edu](http://umuc.edu)), offer hundreds of courses and dozens of degrees online to students worldwide. The California Virtual Campus ([cvc.edu](http://cvc.edu)) provides a directory and links to thousands of courses and online degree programs offered by colleges and universities in California (see [cvc.edu/courses](http://cvc.edu/courses)). For information about distance learning resources and online universities, see [distancelearn.about.com](http://distancelearn.about.com). For a list of the

**Figure 5.4** The Engkey— Robot English teacher. (Source: The Korea Advanced Institute of Science and Technology.) Used with permission



top online MBA programs in the world, see [onlinemba.com/rankings](http://onlinemba.com/rankings).

### **Innovations in E-Learning**

There are many innovations in e-learning, one of which is shown in the following example.

#### **Example: E-Learning via Robots**

In December 2010, the city of Daegu in South Korea introduced 29 robots into 19 elementary schools. Each robot, about 3.2 feet tall, was designed to teach English to the students. Developed by the Korea Institute of Science and Technology (KIST), the robots roll around on wheels and ask questions in English (see Figure 5.4). (For details, see [cnet.com/news/korean-schools-welcome-more-robot-teachers](http://cnet.com/news/korean-schools-welcome-more-robot-teachers).)

The robots can be moved around the classroom by the instructor (via remote control), which facilitates the interaction of teachers with students. The robots can read books to the students and even “dance” to music. The robots display the face of a “teacher.” The tutoring is actually provided by experienced teachers in the Philippines, who are paid much less than Korean teachers. The robots are programed to use the most effective and current teaching methods (e.g., using multimedia games).

Cameras detect the Filipino teachers’ facial expressions and instantly reflect them on the robot’s avatar face. The students participate more actively, especially the shy ones who are afraid of speaking out loud. The robots are also used in remote rural areas where English teachers are in short supply.

For more examples on educational robotic teachers, see [nytimes.com/2010/07/11/science/11robots.html?pagewanted=all&r=0](http://nytimes.com/2010/07/11/science/11robots.html?pagewanted=all&r=0). For more on robotic telepresence for distance education, watch the 2 min video and see the text at [verizon.com/powerfulanswers/solutions/education](http://verizon.com/powerfulanswers/solutions/education).

### **Online Corporate Training**

Like educational institutions, a large number of business organizations are using e-learning on a large scale. Many companies, such as Cisco Systems ([cisco.com](http://cisco.com)), offer online training. A study by the American Society for Training and Development found that nearly one-third of corporate training content was delivered electronically.

Corporate training is driven by multiple factors and is often done via intranets and corporate portals. However, the students use the Internet as well. It has several variations, one of which is *on-demand online training*, which is offered by software companies such as Citrix Systems ([citrix.com](http://citrix.com)). However, in large corporations with multiple sites, and for studies from home, the Internet is used to access the online material. Vendors’ success stories of online training and educational materials can be found at [adobe.com/resources/elearning](http://adobe.com/resources/elearning) and at [brightwave.co.uk](http://brightwave.co.uk). For a comprehensive guide to online training, see Kaattari and Trottier (2012).

#### **Example: Dresser-Rand**

Dresser-Rand is a global U.S. corporation that makes compression equipment. It has over 5500 employees in 50 different locations in 26 countries that speak 14 different languages. The company needs to do extensive training due to growth and employee retirement. Previously, the company used over 600 training vendors to conduct training. A major challenge was the update of the teaching material due to technological changes. Using the learning management system (LMS) from Coastal eLearning ([training.dupont.com](http://training.dupont.com); now a part of DuPont Sustainable Solutions), the company deployed a comprehensive online training program via Dresser-Rand University, saving over \$1 million per year. To read the case study, see [training.dupont.com/pdf/case-study/dresser-rand-v1211.pdf](http://training.dupont.com/pdf/case-study/dresser-rand-v1211.pdf).

### Using Computer Games for Training Current and New Employees

There is a trend to use computer simulation games for training.

#### Example: Marriott International

Marriott International developed a game “My Marriott Hotel,” available on Facebook for help in recruiting and training. The players learn how hotels and their restaurants operate. Initially, Marriott developed a game for the kitchen. The players needed to choose what ingredients to use for different foods (based on price and quality). The players also learned how to select employees from a pool of candidates and make decisions about equipment purchasing. They also learned about food quality.

### Social Networks and E-Learning

Since its inception, social networking has been interrelated with learning. A new term, **social learning**, also known as *e-learning 2.0*, has been coined to describe the learning, training, and knowledge sharing in social networks and/or facilitated with social software tools. Social environments facilitate high-tech-based training, making it possible for learners to share their experiences with others. Thus, several companies already are using social media for training and development purposes (e.g., see [advancinginsights.com](http://advancinginsights.com)). Social learning is based on *social learning theory*. For details, see [en.wikipedia.org/wiki/Social\\_learning\\_theory](http://en.wikipedia.org/wiki/Social_learning_theory).

Some students use Facebook, LinkedIn, Pinterest, Twitter, and so forth to connect with other pupils. For example, learners can study together, discuss topics or brainstorm online. Unfortunately, the distractions found on some networks can make it difficult to focus on learning. Some companies use social media to engage employees in group learning via knowledge sharing.

Several social networks (or communities) are dedicated to learning and training (e.g., see [elearning.co.uk](http://elearning.co.uk)). An example of a social network for learning is LearnHub ([learnhub.com](http://learnhub.com)), which is dedicated to international education. Some scholars believe that the future of e-learning is social learning.

Social networking technology possesses the following capabilities that may facilitate learning:

- *Connect learners in a learning project.* It enables people to connect in real time for discussion, collaboration, and problem-solving.
- *Make “social” part of the company’s learning strategy.*

- *Build the know-how of experts.*
- *Enable learners to engage.* Generation X and Millennial workers use Web 2.0 tools extensively for interacting among themselves and with others. Organizations can reach out to this group and use social networks for training.
- *Use platforms such as Pinterest to develop creativity in design and to use images to sharpen some learning skills.*
- *Provide relevant content prior to off-line meetings for voting, or requesting supplements.* This can enrich and facilitate classroom delivery.
- *Link learners to relevant resources and let them rate and share opinions.*
- *Quickly identify the training needs and implementation issues of individuals and groups.*
- *Have learners provide social support to each other.*
- *Improve and expedite learning-related communication (e.g., via Twitter).*

Many universities combine e-learning and social networking; also, numerous professors have blogs and wikis for their classes and encourage communication and collaboration via Facebook.

### Visual Interactive Simulation

An effective technology for e-training and e-learning is *visual interactive simulation* (VIS), which uses computer graphic displays to present the impact of evaluating alternative solutions to problems. It differs from regular graphics in that the user can manipulate the decision-making process and see the results of the interventions. Some learners respond better to graphic displays, especially when they are interactive. For example, VIS was used to examine the operations of a physician clinic environment within a physician network in an effort to provide high-quality medical care. The simulation system identified the most important input factors that significantly affected performance. These inputs, when properly managed, led to lower costs and a higher level of medical care.

VIS systems provide the following major potential benefits:

- Shorten learning time.
- Aid in teaching how to operate complex equipment.
- Enable self-paced learning, any place, anytime.
- Aid in memorization.
- Lower overall training costs.
- Record an individual’s learning progress and improve on it.

Visual interactive simulation is closely related to virtual reality (Chapter 2).

## E-Learning Management Systems

A **learning management system (LMS)** (also known as a course management system) consists of software applications for managing e-training and e-learning programs including content, scheduling, delivery tips, and so forth. Captterra Inc. Learning Management System Software ([captterra.com/learning-management-system-software](http://captterra.com/learning-management-system-software)) and similar systems exhibit these capabilities:

- Provide effective student–instructor interactions.
- Centralize and automate program administration.
- Enable the use of self-service and self-guided e-learning services.
- Create and rapidly deliver learning content modules.
- Provide a single point of access to all e-learning online materials.
- Help manage compliance requirements.
- Consolidate training initiatives on a scalable Web-based platform.
- Support the portability of systems.
- Increase the efficiency and effectiveness of e-learning.
- Personalize content and enable knowledge reuse.

Many companies (e.g., Saba Software, Inc.; [saba.com/us/lms](http://saba.com/us/lms), SumTotal Systems; [sumtotalsystems.com](http://sumtotalsystems.com)) provide methodologies, software, hardware, and consultation about e-learning and its management. For more on LMS, see [en.wikipedia.org/wiki/Learning\\_management\\_system](http://en.wikipedia.org/wiki/Learning_management_system) and watch the video titled “What is a Learning Management System?” (2:51 min) at [proprofs.com/c/category/lms](http://proprofs.com/c/category/lms).

Note that it is possible to control what the students are doing when they self-study. For example, according to Streitfeld (2013), teachers can find out when students are skipping pages, not bothering to take notes, or failing to highlight significant passages.

One of the most effective tools for learning management is Blackboard Inc. ([blackboard.com](http://blackboard.com); now combined with WebCT). A brief description follows.

### Example 1: Blackboard

Blackboard Inc. ([blackboard.com](http://blackboard.com)) is the world’s largest supplier of course management system software for educational institutions. How do Blackboard products work? A textbook publisher places a book’s content, teaching notes, quizzes, and other materials on a Blackboard in a standard-

ized format. Instructors can access modules and transfer them on to their university’s Blackboard sites, which can be accessed by their students.

A professor can easily incorporate a book’s content into Blackboard’s software. As of 2009, Blackboard also delivers corporate and government employee training programs worldwide which increases productivity and reduces costs. For details, see [blackboard.com](http://blackboard.com) and [en.wikipedia.org/wiki/Blackboard\\_Inc](http://en.wikipedia.org/wiki/Blackboard_Inc).

### Example 2: Moodle

An alternative to Blackboard is a mostly free open source system called Moodle (see [moodle.org](http://moodle.org)).

## Electronic Books (E-Books)

An **electronic book (e-book)** is a book in digital format that can be read on a computer screen, mobile device, or on a dedicated device known as an *e-reader*. A major event in electronic publishing occurred in 2000, when Stephen King’s book *Riding the Bullet* was published exclusively online. For \$2.50, readers were able to purchase the e-book on Amazon.com and other e-book providers. Several hundred thousand copies were sold in a few days. However, hackers broke the security protection, copied the book and distributed free copies of the book online. (See [bookbusinessmag.com/article/after-riding-bullet-12555/1#](http://bookbusinessmag.com/article/after-riding-bullet-12555/1#).)

Publishers of e-books have since become more sophisticated, and online publishing has become more secure. Today there are several types of e-books that can be delivered and read in various ways:

- **Via a dedicated reader.** The book must be downloaded to an e-reader such as Amazon’s Kindle.
- **Via Web access.** Readers can locate a book on the publisher’s website and read it there. The book cannot be downloaded.
- **Via Web download and smart phones.** Readers can download the book to a PC.
- **Via a general-purpose reader.** The book can be downloaded to a mobile device such as an iPad or iPhone.
- **Via a Web server.** The contents of a book are stored on a Web server and downloaded for print-on-demand (which is discussed later in this book).

Most e-books require some type of payment. Readers either pay before they download a book from a website, such as buying a Kindle copy on Amazon.com, or they pay when they order the special CD-ROM edition of a book. Today, Amazon.com offers hundreds of thousands of e-books,

e-newspapers (including international ones), and other digital products. All are cheaper than the hard-copy version (e.g., new release books may cost \$10 or less). There are many free e-books as well (e.g., [free-ebooks.net](http://free-ebooks.net) and [onlinebooks.library.upenn.edu](http://onlinebooks.library.upenn.edu)).

### **Devices for Reading E-Books**

The major device used to read an e-book is an e-reader. Most e-readers are lightweight (about 10 ounces) and are convenient to carry. The major e-readers and tablets are listed and compared at [the-ebook-reader.com](http://the-ebook-reader.com).

Several other aids are available to help readers who want to read a large amount of material online. For example, Microsoft ClearType ([microsoft.com/typography/ClearTypeInfo.aspx](http://microsoft.com/typography/ClearTypeInfo.aspx)) and CoolType from Adobe ([adobe.com](http://adobe.com)) can be used to improve screen display, colors, and font sizes. Glowing screens can help you read in the dark (e.g., Kindle Touch and the Kindle Fire have a built-in light).

### **Combining E-Readers and Tablets**

The trend today is to combine e-readers with tablet computers as was initiated with Amazon's Kindle Fire. The 7-inch portable devices allow people to read books, magazines, and documents, and listen to audio books. Users can play games, listen to music, watch movies and TV shows, and much more. Kindle has Internet access via Wi-Fi, so social network access and e-mail is also available. Finally, with Amazon's Kindle Owner's Lending Library, Kindle owners who have Amazon Prime can choose from a selection of hundreds of thousands of books to borrow, for free with no due dates.

Note: Tablet manufacturers also offer a combination of e-readers and tablets. The difference is that e-reader-based products such as Kindle Fire have less computing capabilities, while tablets such as iPad have a less capable e-reader and are more expensive.

### **Advantages and Limitations of E-Books**

For e-books to make an impact, they must offer advantages to both readers and publishers. Otherwise, there would be little incentive to change from traditional books. Indeed, e-book sales are exploding due to the following advantages:

- Ability to store hundreds of books on a small mobile device. (External storage can hold much more.)
- Lower cost to buyers. The simple e-reader model costs less than \$75; the tablet-based less than \$200.
- Searchable text—you can show links and connect easily to the Web.

- Instant delivery via downloads from anywhere. The tablet-based models provide you with many of the capabilities of other types of mobile computers.
- Portability—they go where you go.
- Easy integration of content from several sources.
- Durability—they are built stronger than a traditional book (but they can break if you are not careful). Also, readers tend not to lose them (again, you need to be careful).
- Ability to enlarge the font size for easy reading and to add light if needed.
- Media rich (audio, color, video, etc.).
- Minimal cost for printing out a hard copy.
- Good readability in bright sunlight (able to read books outdoors).
- Easy updating of content.
- Almost no wear and tear.
- Easy to find out-of-print books.

The primary advantage that e-books offer publishers is lower production, marketing, and distribution (shipment) costs, which have a significant impact on the price of books (e-textbooks are about 50% cheaper than print versions). Other advantages for publishers are lower updating and reproduction costs, the ability to reach many readers, and the ease of combining chapters from several books to create customized textbooks, so professors can use materials from different books (usually by the same publisher) in one course.

Finally, the light weight of the tablet can eliminate the back pain that people, especially school children, have from carrying backpacks full of heavy books.

Of course, e-books have some limitations: They require hardware and software that may be too expensive for some readers; some people have difficulty reading large amounts of material on a relatively small computer screen; batteries may run out; and there are multiple, competing software and hardware standards to choose from, confusing the buyers. Several of these obstacles may lessen in time.

### **A Final Note: Is This the End of Printed Books?**

According to Amazon.com, in 2011, the sales of e-books on their site considerably exceeded the sales of hardcover and paperback books. (See [nytimes.com/2011/05/20/technology/20amazon.html](http://nytimes.com/2011/05/20/technology/20amazon.html)). By 2014, e-book sales surpassed the sales of paper-based books. (For all publishers.) However, according to Nuwer (2016), sales of e-books have plateaued.

Despite the limitations, e-books have become very popular, especially due to sophisticated e-readers. For example, even the Harry Potter books are now available in electronic format and they are not encrypted, so that readers can move the books between mobile devices and even to a PC. For

a comparison between e-books and printed books, see [thrall.org/docs/ebooksandbooks.pdf](http://thrall.org/docs/ebooksandbooks.pdf) and [en.wikipedia.org/wiki/E-book](http://en.wikipedia.org/wiki/E-book).

The question is: Will most printed books be eliminated? The trend is very clear. Sales of printed books are on the decline, while e-books are up. With Amazon's free loan of Kindle books to their Prime members, we expect even more people reading e-books. Are paper books going to disappear? (See discussion by Vaughan-Nichols 2012.) For the advantages of e-books versus traditional books, see [online-bookstores-review.toptenreviews.com/the-advantages-of-ebooks-versus-traditional-books.html](http://online-bookstores-review.toptenreviews.com/the-advantages-of-ebooks-versus-traditional-books.html).

---

## SECTION 5.2 REVIEW QUESTIONS

1. Define e-learning and describe its drivers and benefits.
2. List some of the major drawbacks of e-learning and describe how they can be prevented.
3. Describe virtual universities and distance learning.
4. Define e-training and describe how it is done.
5. Describe the connection between e-learning and social networking.
6. List some e-learning tools, and describe Blackboard and visual interactive simulation (VIS).
7. Describe e-books.
8. What is an e-reader? What are its major capabilities?
9. List the major advantages and limitations of e-books to their users.

---

## 5.3 KNOWLEDGE MANAGEMENT, INTELLIGENT SYSTEMS, AND ROBOTS

The term *knowledge management* is frequently mentioned in discussions about e-learning. Why is this? To answer this question, you first need to understand what knowledge management is.

### An Overview of Knowledge Management

Knowledge management and e-learning are both centered on knowledge. Whereas e-learning uses knowledge to enhance individual learning, knowledge management is essential for improving the operation of individuals' organizations, or teams. Knowledge is one of the most important assets in any organization, and thus it is important to capture, store, secure, and reuse (share) it. These are the major purposes of knowledge management. Thus, **knowledge management (KM)**

refers to the process of capturing or creating knowledge, storing and protecting it, updating it constantly, disseminating it, and using it whenever necessary (see [en.wikipedia.org/wiki/Knowledge\\_management](http://en.wikipedia.org/wiki/Knowledge_management) and Milton and Lambe 2016).

Knowledge in organizations is collected from both external and internal sources. It is then examined, interpreted, refined, and stored in what is called an *organizational knowledge base*, the repository for the enterprise's knowledge. A major purpose of an organizational knowledge base is to allow for *knowledge sharing*.

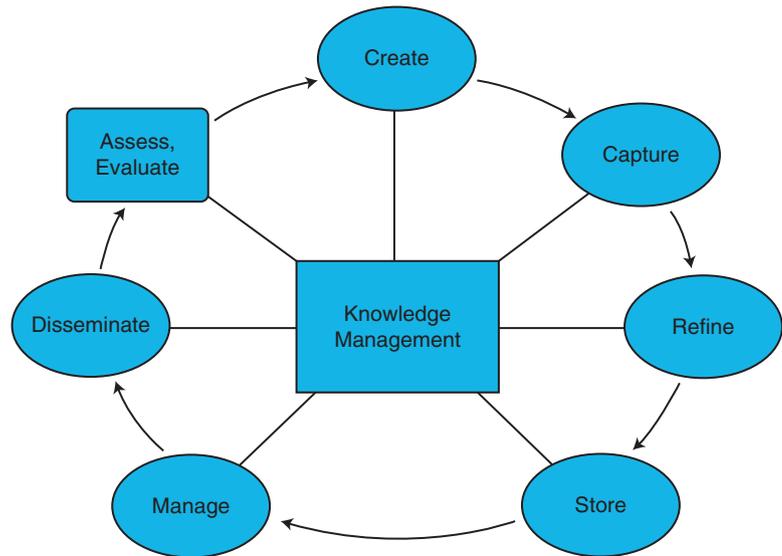
### Knowledge Management Types and Activities

Organizational knowledge is embedded in the following key resources: (1) human capital, which includes employee knowledge, competencies, intelligence, and creativity; (2) organizational capital, which includes stored organizational experiences (e.g., best practices, patents, manuals, teaching materials); and (3) customer and partner capital, which includes the experience of working with customers and business partners.

This organizational knowledge must be managed properly and leveraged through sharing and dissemination. This is the major purpose of KM, which has the following major tasks:

- **Create knowledge.** Knowledge is created as people gain more experience (e.g., trial-and-error) and education. Sometimes, external knowledge is brought in (e.g., provided by vendors and consultants).
- **Capture knowledge.** Existing knowledge must be identified and assembled. Remember that, a considerable amount of knowledge is not documented, and just dwells in people's memory.
- **Refine knowledge.** New knowledge must be placed in context so that it is actionable. This is why human insights (tacit qualities) must be captured along with explicit facts.
- **Store knowledge.** Useful knowledge must be stored into an easily retrievable format in a secured knowledge repository.
- **Update knowledge.** The knowledge must be kept current. It must be reviewed to verify that it is relevant and accurate; if not, it must be updated.
- **Disseminate knowledge.** Knowledge must be made available in a useful format to anyone in the organization who needs it, and who is authorized to access it.

**Figure 5.5** The knowledge management system cycle



These tasks can be viewed as a cyclical process, as shown in Figure 5.5. The objective of e-commerce is to automate KM activities as well as help in using the stored knowledge.

For a comprehensive list of KM activities and tools, see [en.wikipedia.org/wiki/Knowledge\\_management](http://en.wikipedia.org/wiki/Knowledge_management) and [kmworld.com](http://kmworld.com).

## Knowledge Sharing

Knowledge is of limited value if not updated and shared. The ability to share and then distribute knowledge decreases its cost per user and increases its effectiveness. Shared knowledge can also decrease risk and uncertainty and facilitate problem-solving. An example of a knowledge-sharing system at Infosys Technologies is provided in Morin (2014).

### Software Tools for Knowledge Sharing

There are many software knowledge-sharing tools. Some call these “knowledge-sharing technologies.” In this chapter and the book, we cover the following:

- Expert and expertise location systems (Section 5.3)
- Knowledge management systems (Section 5.3)
- Social networks and Web 2.0 tools (Chapter 7)

## How is Knowledge Management Related to E-Commerce?

Organizations need knowledge, which is provided by KM, in order to better perform their tasks.

In the past, KM and EC initiatives were dealt with independently; however, they can be used together for mutual benefit.

### Examples

According to Britt (2013), “E-commerce retailers are using knowledge management solutions to pull together order, inventory, sales, and other transaction information, as well as to improve customer feedback and to enhance the overall e-commerce experience.” Britt provides the following examples:

- Dog is Good Inc. (a merchant of “canine-themed apparel”) is using KM to help in the integration of EC subsystems (ordering, inventory, order fulfillment, accounting, and EC stores) using the offerings from NetSuite.
- Ideeli, Inc., an online daily flash retailer, uses KM analytics (ForeSee Satisfaction Analytics) to learn about customer experiences from collected feedback.
- Ideeli, Inc. also uses KM analytics (ForeSee’s mobile analytics solution) to identify the needs of frequent visitors (by segments on mobile devices). As a result, the company modified its e-commerce strategies.
- Retina-X Studios provides tracking and monitoring of activities on mobile phones, computing devices, etc. The KM system is used to improve the handling of EC chargebacks due to cancellation. The company turned to Avangate’s e-commerce solution that cut costs and improved customer service.

Some managers believe that a major EC-related role of KM is linking EC and business processes. Specifically, knowledge generated in EC contributes to the enhancement of three core processes: CRM, SCM, and product develop-

ment management. For more on KM-enabling technologies and how they can be applied to business unit initiatives, see [kmworld.com](http://kmworld.com) and [knowledgestorm.com](http://knowledgestorm.com).

## KM and Social Networks

A major place of knowledge creation is in online communities, including social networks. This is done by *crowdsourcing* and customer and employee discussions and feedback. This area has several variations. One variety is limited within a single company (see the Knowledge Network in the Caterpillar Online File W5.3). Knowledge can also be created by *user-generated content* (see Chapter 7) and in the “answer” function of some social networks.

Web 2.0 applications help aggregate corporate knowledge, facilitate communication and collaboration, and simplify the building of repositories of best practices, as demonstrated by the following example.

### Example: IBM Jam Events

Since 2001, IBM has been using communities for online brainstorming sessions, idea generation, and problem-solving. These sessions are called “Jam Events.” According to their Web page, “IBM’s Jams and other Web 2.0 collaborative mediums are opening up tremendous possibilities for collaborative innovation...” ([collaborationjam.com](http://collaborationjam.com)). Each Jam has a different topic. For example, a large IBM online brainstorming session held, called the *Innovation Jam*, brought a community of over 150,000 employees from 104 countries and 67 companies to launch new IBM businesses (see [collaborationjam.com](http://collaborationjam.com)).

Virtual meetings where IBM employees can participate in Innovation Jam launches were conducted in Second Life (SL). IBM’s former CEO even created an avatar to represent himself. Besides business, recent topics that have been explored by IBM Jams include social issues. See [collaborationjam.com/IBMJam](http://collaborationjam.com/IBMJam). Other topics that have been explored are new technologies for water filtration, 3-D Internet, and branchless banking. For the history of IBM Jams, see [collaborationjam.com/IBMJam](http://collaborationjam.com/IBMJam).

## Finding Expertise and/or Experts Electronically and the Use of Expert Location Systems

Expert advice can be provided within an organization in a variety of ways. Human expertise is rare; therefore, companies attempt to preserve it electronically, *as expert systems*, in corporate knowledge bases. Users may look for human experts to answer their questions or they may search the knowledge bases for expertise.

People who need help may post their inquiries internally on corporate intranets (e.g., using special Q&A platforms, or

discuss their issue in forums or blogs), or on public social networks such as Yahoo! Answers ([answers.yahoo.com](http://answers.yahoo.com)), that have a “search answers” feature. Similarly, companies may ask for advice on how to solve problems or exploit an opportunity and offer incentives to participate. Answers may generate hundreds of useful ideas within a few days. This is a kind of brainstorming. Companies also use crowdsourcing to solicit advice (see Chapter 8).

### Answers Provided by People on Social Networks or Portals

Several social networks (e.g., [linkedin.com](http://linkedin.com)), or Internet portals (e.g., [answers.yahoo.com](http://answers.yahoo.com)) offer free or “for fee” Q&A capabilities.

#### Example: Yahoo! Answers

Yahoo! Answers ([answers.yahoo.com](http://answers.yahoo.com)) allows you to post a question, for free.

One of the authors of this book posted the following question on Yahoo! Answers.

Question: “My Yahoo! e-mail has been hijacked. The spammer sends requests for money in my name to all the people on my contact list. What should I do?” Answer (Anonymous): (Best answer-chosen by voters): “The spammer could have obtained your password with phishing spam. Change your password. While you are in your account settings, check for tampering with your alternate e-mail contact address. That could be used to obtain new passwords. Also, abstain from clicking on links within your spam. That spammer’s webpage can run a malicious script. This runs within your browser and can tell webmail currently logged in within that browser to send spam.”

The answers provided by Yahoo! are usually generated manually by volunteers for free. Sometimes the answers are generated automatically, as described in the next section.

### Automated Question–Answer Systems

In addition to advice provided by humans, an increasing number of applications attempt to provide automated answers to users’ questions. The expert finding system described in the following section is an example of such a system. The user asks a question and the computer tries to find an answer that best matches the question. The goal of an **automated question–answer (Q&A) system** is to find answers that match questions asked in a natural language (e.g., English, Chinese).

#### Example: Search Engine Advice

Answers.com and Ask.com belong to a special category of search engines containing a massive collection of questions, each with pre-generated answers. A computer intelligent engine tries to match a question asked in a natural language with a standard question within its matched answer.

A Q&A system differs from *frequently asked questions* (FAQ) in that the content of an FAQ is fairly structured and limited in its size, concentrating on “frequently asked questions.” In addition, an FAQ posts questions to choose from while in a Q&A forum, users ask unstructured questions in a natural language.

To begin, the computer needs to understand the questions (e.g., by using natural language understanding software); then, the computer can search for matching answers. There are several methods for computers to find the answers to such questions. One method is based on the use of Artificial Intelligence (AI) by using intelligent agents such as knowledge-based systems. Trying to reason automatically from historical cases is another popular approach.

### Example: IBM PureSystems

IBM PureSystems are an Expert Integrated System family of intelligent computer systems designed to help companies solve IT challenges. They are based on Cloud Computing. For details, see [ibm.com/ibm/puresystems/us/en/index.html](http://ibm.com/ibm/puresystems/us/en/index.html).

### Live Chat with Experts

Live chats with experts are becoming popular. For example, you can chat with physicians practicing different specialties. You can do the same with many other professionals. Many companies provide live chat (similar to Yahoo Messenger or Facebook’s messenger). The waiting time for replies is usually short.

### Chat with Avatars

You can chat with avatars that use a collection of preprogrammed Q&A. Such a service is very inexpensive (but may be not too accurate). The quality of the answers is increasing as the knowledge base increases and as the ability of the computer to understand natural language improves. For example, see Ted, the Virtual Investment Consultant at TD Ameritrade ([tdameritrade.com/virtualclient/about.html](http://tdameritrade.com/virtualclient/about.html)).

### Expert Location Systems

Expert/expertise location systems (ELS) are interactive computerized systems that help employees locate experts within their organization in order to get help in solving specific, critical business or technical problems, in a short time. Expertise location systems are designed to:

- Identify experts in specific domain areas inside organizations.
- Link people to information about such experts and enable contacts with them.

- Assist employees with advice on career development.
- Provide support for teamwork and groups in social networks.

Software for such systems is made by companies such as IBM and RightNow Technologies (an Oracle company). For benefits, features, and demonstrations, see Hivemine AskMe ([hivemine.com/products.php#whyaskme](http://hivemine.com/products.php#whyaskme)) and AskMe’s Product Data Sheet ([hivemine.com/download/Hivemine%20AskMe%20Datasheet.pdf](http://hivemine.com/download/Hivemine%20AskMe%20Datasheet.pdf)). Most expert location systems work in a similar manner, exploring knowledge bases for either an answer to the problem (if it exists there) or for locating qualified experts. The general process is shown in Figure 5.6.

The four steps of the process are:

1. An employee submits a question to the ELS.
2. The software searches its database to see if an answer to the question already exists. If it exists, the information (research reports, spreadsheets, etc.) is returned to the employee. If not, the software searches documents and archived communications for an expert in the domain area.
3. Once an expert candidate is located, the system asks if he or she is able to answer the question. If so, the expert submits a response. If the expert is unable to respond, he or she can elect to reroute the question to the next appropriate expert until one responds.
4. After an answer to the question is found, it is reviewed for accuracy by a corporate advisor and sent to the person who made the query. At the same time, the question and its response are added to the knowledge repository to be used in future similar situations.

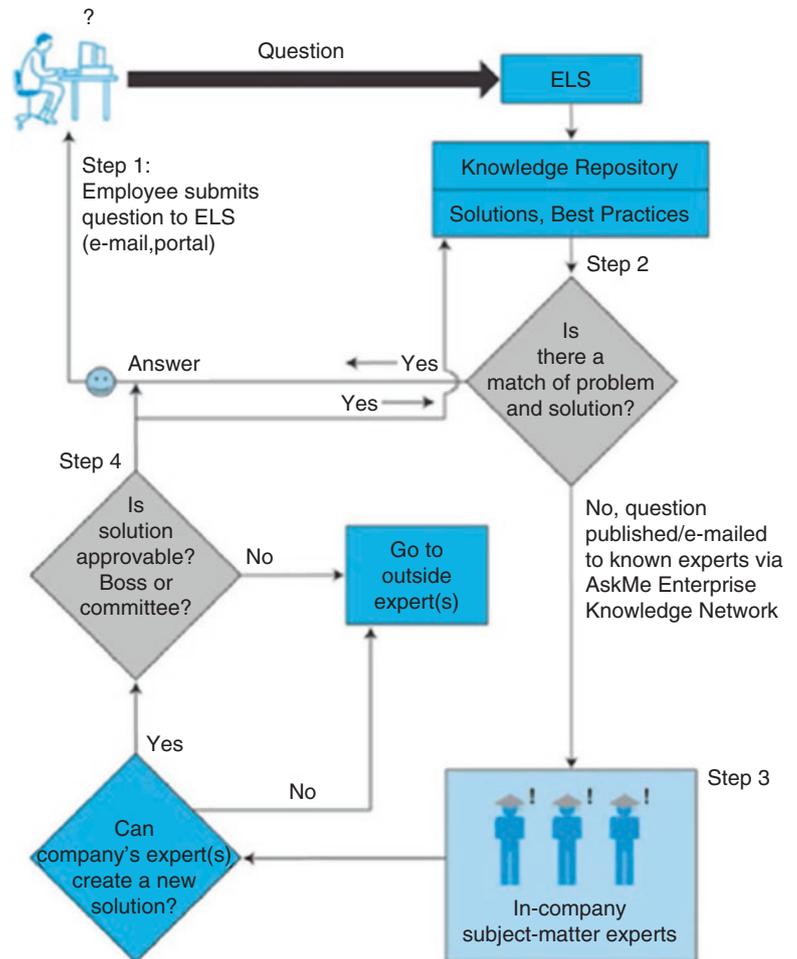
### Seeking Expertise in Social Networks

Seeking expertise (and experts) is becoming a very popular social activity. People post their queries on bulletin boards, forums, and blogs and wait for responses. One of the features of LinkedIn is the free “Help Forum,” where users can post questions to get help from forum members or start a discussion.

### Knowledge-Based and Intelligent Systems

There is an increasing trend to make e-commerce “smarter.” As seen in Chapter 2, Web 3.0 presumes to enable systems to exhibit more intelligence. This means more automation in various e-commerce activities. For example, the area of machine translation of languages is already helping people to buy online products that are advertised in languages they do not speak. Similarly, machine translation can help people

**Figure 5.6** AskMe's expert location system



that know only their own language to converse, in real time, with people speaking other languages.

More complex applications are those that can help in answering customers' questions made in natural languages. Another area is that of *knowledge-based systems* (also known as *expert systems*). These systems can assist people in making decisions, and even make decisions on their own. For example, such systems can approve or reject companies' requests to purchase online (if they are not preapproved, or do not have a credit line). Other examples include the automation of generating online purchasing orders, and expediting fulfillments. Both Google and Facebook are experimenting with projects that attempt to teach machines how to learn (*machine learning*) and make decisions. Other companies doing the same (e.g., Toyota); see Markoff (2015). For applications in the enterprise, see Dodge (2016).

Knowledge-based systems are also important for *innovation* (see [spigit.com](http://spigit.com)) and they are related to the areas of analytics and big data processing. One of the most advanced projects in this area is IBM's Watson Analytics (e.g., see Taft 2016 and Nicolai 2015).

In January 2016, Mark Zuckerberg, the CEO of Facebook, announced that his goal is to build in 2016 an AI-based assistant to help in his personal and business activities and decisions. Zuckerberg is teaching a machine to understand his voice and follow his basic commands as well as to recognize faces of people. These are actually capabilities of smart robots.

#### Example: Pitney Bowes Is Getting Smarter with AI

Pitney Bowes Inc. is a U.S.-based global e-commerce solution provider in areas such as shipping and mailing products, location intelligence, customer engagement, and customer information management. The company powers billions of physical and digital transactions annually, across the connected and borderless world of commerce.

Today, prices are depending on the dimensions, weight, and packaging of each product. The prices' calculations create data that are fed into algorithms. The more data are collected, the more accurate are the calculations. The company estimates a 25% improvement in accuracy yield from their algorithms.

### Robotics in E-Commerce

Robots play an increased role in e-commerce. Perhaps the most well known are Amazon.com's applications in their warehouses (see Chapter 11). Robots are also used extensively in make-to-order manufacturing, which enable *mass customization* (Chapter 11). For an application at Lowe's, see King (2014). Robots act as avatars providing guidance and information online, as well as in the physical worlds (e.g., in airports or other public places). In some cases, robots are autonomous; they can even drive cars. In other cases, robots work hand-in-hand with humans. For many 2015 applications, see Demaitre (2015).

---

## SECTION 5.3 REVIEW QUESTIONS

1. Define knowledge management.
2. Discuss the relationship between KM and EC.
3. Describe online advisory services.
4. Describe expert location systems and their benefits.
5. Relate social networks to providing advice.

---

## 5.4 E-HEALTH

One of the major application areas of e-commerce is e-health.

### Definition

The term has many definitions (Wikipedia reports about 51 of them). The *World Health Organization* (WHO) defines e-health as follows:

“**E-health** is the transfer of health resources and health care by electronic means. It encompasses three main areas:

- The delivery of health information, for health professionals and health consumers, through the Internet and telecommunications.
- Using the power of IT and e-commerce to improve public health services, (e.g., through the education and training of health workers).
- The use of e-commerce and e-business practices in health systems management.”

The major concern of WHO ([who.int/trade/glossary/story021/en](http://who.int/trade/glossary/story021/en)) is the efficient use of health resources for providing better and safer health care worldwide. E-health is an extremely broad field (see [en.wikipedia.org/wiki/Ehealth](http://en.wikipedia.org/wiki/Ehealth)). E-health is completely changing health care (see Elton and O'Riordan 2016). For use of artificial intelligence in e-health, see Estopace (2016).

Here we cover only few representative areas that directly relate to e-commerce.

### Electronic Medical Record Systems (EMR)

One of the earliest applications of e-health was the electronic medical record system. The objective was to enable accessibility to patient medical records from any location, even from other cities and countries. With the spread of the Web, this application is growing rapidly. For example, one of the authors can see the results of all his blood tests and certain medical records from any place at anytime, on the Web. In some progressive hospitals, a doctor can pull the medical records whenever he or she needs to see them. One problem is the protection of privacy and assuring the appropriate use of data. In addition, there is an issue of accessibility to the medical records of patients by researchers.

### Doctors' System

Today doctors have immediate access to patient records. They can place orders directly to testing facilities (both internal and external). They can order medications directly from pharmacies, contact specialists, discharge patients in remote locations, and review results of tests from faraway locations. For many additional applications and for comprehensive coverage, see Wachter (2015).

### Patients Services

Large numbers of patients' services are available today due to advances in electronic medical record applications. Scheduling appointments from home and reading results of tests from anywhere and anytime are common. Patients enjoy better care due to the availability of Wi-Fi networks (see closing case in this chapter) that enable fast access to information by providers. For use of robots, see Editors (2015). Patients can find a vast amount of information on hundreds of websites such as WebMD.com. They enjoy the advancements in medicine due to computerized systems. For comprehensive coverage, see Combs et al. (2016).

### Social Media and Commerce

The health care industry was a lagger in adopting social media and social commerce. However, as reported by Lawson (2015) and Mayo Clinic Center for Social Media (2012), this situation is changing. The health care participants are becoming actively engaged with one another. Patients report their

experiences so others can learn. Doctors have their own professional social networks and other caregivers have similar networks. Medical portals, such as WebMD, disseminate information about many topics, inviting the public to comment. Many health care providers have a presence on Facebook, LinkedIn, and other social networks. Large numbers of bloggers provide their opinions on legal, medical, political, financial, and other related topics. One can find a lot of advice on what to eat, how to exercise, and what prescription medicine pills are good for you. Of course, there is extensive advertising all over the social media outlets. For a discussion, see *Forbes* (2014).

### Medical Devices and Patients Surveillance

Large numbers of EC medical devices are used in the health industry. Some of the most well-known ones are robots that help in surgeries, sensors that monitor vital signs of patients and the location of handicapped patients. Considerable use of telecommunication is evidenced in medical facilities (see closing case in this chapter). Known as *telematics*, telemedicine information technologies are used to diagnose and treat diseases from the distance (e.g., in rural areas that has no doctors). A futuristic area is that of the *Internet of Things* (see Chapter 6), where many medical devices and sensors will be combined for new medical treatments. (See [healthanalytics.com/news](http://healthanalytics.com/news).) A related area is patient monitoring (e.g., see Behr 2016).

### Medical Research

Computer-assisted telecommunication provides access to medical knowledge and help in collaboration among researchers. Such collaboration may expedite new discoveries and save the lives of many patients. For an example of transmission of brain signals, see [enterpriseinnovation.net/article/ntu-develops-smart-chip-wireless-transmissions-brain-signals-1166441949](http://enterpriseinnovation.net/article/ntu-develops-smart-chip-wireless-transmissions-brain-signals-1166441949).

### Administrative Purposes

Health care providers can save a lot of money by using e-commerce models such as e-procurement, group purchasing of supplies, advertising in social networks, recruitment with the help of LinkedIn and Facebook, and much more. For an example of medical schedules, see Zocdoc.com. Another example is the use of *predictive analysis* to predict which employees might get sick (Silverman 2016). Health care facilities can use B2B to make supply chain-related decision on medical supplies, saving a considerable amount of money (see Insitesoft 2015).

## SECTION 5.4 REVIEW QUESTIONS

1. Define e-health.
2. Describe EMR. Why is it important?
3. Describe social media and commerce in e-health.
4. Describe the major e-health applications in brief.

## 5.5 CONSUMER-TO-CONSUMER ELECTRONIC COMMERCE

**Consumer-to-consumer (C2C) EC**, which is sometimes called *person-to-person (P2P) e-commerce*, refers to electronic transactions conducted between and among individuals. These transactions can also include intermediaries, such as eBay ([ebay.com](http://ebay.com)) or social network sites that organize, manage, and facilitate the C2C transactions. C2C activities may include transactions resulting from classified ads, music and file sharing, career and job matching (e.g., at [linkedin.com](http://linkedin.com) and [careerone.com.au](http://careerone.com.au)), money lending [lendingclub.com](http://lendingclub.com), and personal matchmaking services (e.g., [match.com](http://match.com)).

C2C EC has given online shopping and trading a new dimension. Although this sort of trading is prevalent in the off-line world (newspaper classified ads, garage sales, etc.), it was not expected to succeed online because of problems regarding trust due to the anonymity of the traders, especially those who are in different locations. This problem was solved by using a third-party payment provider (e.g., [paypal.com](http://paypal.com)) and escrow or insurance services provided by eBay and others. One advantage of C2C EC is that it reduces the administrative and commission costs for both buyers and sellers. It also gives many individuals and small business owners a low-cost way to sell their goods and services.

Social networks have become a popular place for C2C activities such as selling products and services via classified ads at [craigslist.org](http://craigslist.org) or [facebook.com](http://facebook.com) and other social networks. People are sharing or selling music, bartering, selling virtual properties, and providing personal services.

### E-Commerce: C2C Applications

Many websites facilitate C2C activities between individuals. We cover several representative applications next.

#### C2C Auctions

A very successful example of a C2C application is participation in auctions. In dozens of countries, selling and buying on auction sites is growing rapidly. Most auctions are managed by intermediaries (the most well-known intermediary is eBay). Consumers can visit auctions at general sites such as [ebay.com](http://ebay.com) or [auctionanything.com](http://auctionanything.com), or they can use specialized sites. In addition, many individuals conduct their own auctions with the

use of special software. For example, ProcurePort.com (see [procureport.com/reverse-auction-services.html](http://procureport.com/reverse-auction-services.html)) provides software to create C2C reverse auction communities online.

### **Selling and Buying in C2C**

In addition to auctions, eBay enables individuals to sell goods to other individuals at fixed prices. Amazon.com and Etsy (Chapter 3) do the same. Hundreds of other sites facilitate C2C trading including those that use classified ads.

### **Person-to-Person Money Lending**

People use the Internet for direct person-to-person money lending. A prime example is the Lending Club Corp. For an overview, see Martin and Amy (2016) and Cunningham (2015).

### **Classified Ads**

Internet-based classified ads have several advantages over newspaper classified ads. They cover a national, rather than a local, audience, and can be updated quickly and easily. Most of them are free or charge very little. This greatly increases the supply of goods and services available and the number of potential buyers. One of the most successful sites of C2C classified ads is [craigslist.org](http://craigslist.org) as seen in Chapter 2. Classified ads also include apartments for rent and corporate housing across the USA (powered by [forrent.com](http://forrent.com)). [Freeclassifieds.com](http://Freeclassifieds.com) allows you to buy or sell anything for free. Many newspapers also offer their classified ads online. In some cases, placing an ad in the classified section of one website automatically directs it into the classified sections of numerous partners (known as cross-posting).

Classified ads appear on thousands of websites, including popular social networks such as [facebook.com/free.classified](http://facebook.com/free.classified) and [linkedin.com](http://linkedin.com).

### **Personal Services**

Numerous personal services are available on the Internet (lawyers, handy helpers, tax preparers, investment clubs, dating services). Some are located in the classified ad section, but others are listed on specialized websites (e.g., [hireahelper.com](http://hireahelper.com)) and directories. Some are offered free; others charge a fee.

Note: Be very careful before looking for any personal services online. Fraud or crime could be involved (e.g., a lawyer online may not be an expert in the area professed or may not even be a lawyer at all).

### **File-Sharing Utilities: Napster and Others**

It all started in 1999. By logging onto services such as Napster, people were able to download files that others were willing to share for free. Such *P2P networks* enabled users to search other members' hard drives for a particular file, including data files created by users or copied from elsewhere. Digital music and games were the most popular files accessed. Movies, TV shows, and videos followed shortly thereafter. Napster had over 60 million members in 2002 before it was forced to stop its service due to copyright violations.

The Napster server, and others that followed, functioned as a directory that listed the files being shared by other users. Once logged onto the server, users could search the directory for specific songs and locate the file owner. They could then directly access the owner's computer and download the songs they had chosen. Napster also included chat rooms to connect its millions of users.

However, a U.S. federal court found Napster to be in violation of copyright laws because it enabled people to obtain music files without paying royalties to the creators of the music. Following this ruling, in March 2002, Napster was forced to shut down and filed for bankruptcy. In 2011, Napster was acquired by Rhapsody ([rhapsody.com](http://rhapsody.com)), a subscription-based music downloading site. For a history of Napster, see [theguardian.com/music/2013/feb/24/napster-music-free-file-sharing](http://theguardian.com/music/2013/feb/24/napster-music-free-file-sharing).

A number of free file-sharing programs still exist (see Chapter 12). For example, an even purer version of P2P is BitTorrent ([bittorrent.com](http://bittorrent.com)), software that makes downloading files fast. To access games over P2P networks, try TrustyFiles ([trustyfiles.com](http://trustyfiles.com)). Despite the temptation to get "something for nothing," remember that downloading copyrighted materials for free is usually against the law.

### **C2C Activities in Social Networks and Trading Virtual Properties**

C2C activities in social networks include the sharing of photos, videos, music, and other files; trading of virtual properties; and conducting other activities. Trading virtual properties is very popular in virtual worlds.

---

## **SECTION 5.5 REVIEW QUESTIONS**

1. Define C2C e-commerce.
2. Describe the benefits of C2C e-commerce.
3. Describe the major e-commerce applications.

4. Define file sharing.
5. Describe file sharing and the legal issues involved (see the Pirate Bay case in Chapter 12).

---

## MANAGERIAL ISSUES

Some managerial issues related to this chapter are as follows.

1. **How do we design the most cost-efficient government e-procurement system?** Several issues are involved and questions may be raised in planning e-government: How much can the governmental e-procurement system save on procurement costs? How can the system be used for procuring small quantities? How do you deal with bidders from outside your country? How can illegal bribery be prevented? What criteria besides cost need to be considered? How should the online and off-line procurement systems be designed? How do you advertise RFQs online? How should the portfolio of auctions and desktop purchasing be constructed? Can the government use commercial B2B sites for procurement? Can businesses use the government procurement system for their own procurement? All these must be considered in an effective design.
2. **How do we design the portfolio of e-learning knowledge sources?** There are many sources of e-learning services. The e-learning management team needs to design the portfolio of the online and off-line training applications, and the internal and external knowledge sources (paid and nonpaid sources). The internal knowledge management system is an important source of training materials for large corporations, whereas external sources could be more cost-effective for small organizations. Obviously, justification of each item in the portfolio is needed, which is related to vendor selection. For illustrative case studies, see [brightwave.co.uk](http://brightwave.co.uk).
3. **How do we incorporate social networking-based learning and services in our organization?** With the proliferation of social networking initiatives in the enterprise comes the issue of how to integrate these with the enterprise system, including CRM, KM, training, and other applications and business processes. One issue is how to balance the quality of knowledge with the scope of knowledge in e-learning and training programs.
4. **What will be the impact of the e-book platform?** If the e-book is widely adopted by readers, the distribution channel of online book sales may be disruptive. This new platform may cannibalize the off-line book retail business. Additionally, there is the need for the protection of intellectual property of digital contents since it is easy to copy and distribute electronic files (see Chapter 12). In general, more e-books will be published and read.

## SUMMARY

In this chapter, you learned about the following EC issues as they relate to the chapter's learning objectives.

1. **E-government activities.** Governments, like any other organization, can use EC applications for great savings and increased effectiveness. Notable applications are e-procurement using reverse auctions, e-payments to and from citizens and businesses, auctioning of surplus goods, and electronic travel and expense management systems. Governments also conduct electronic business with other governments. As a result, governments can do a better job with less money.
2. **Implementing e-government to citizens, businesses, and its own operations.** Governments worldwide are providing a variety of services to citizens over the Internet. Such initiatives increase citizen satisfaction and decrease government expenses for providing citizens' service applications, including electronic voting. Governments also are active in electronic trading with businesses. Finally, EC can be conducted within and between governments. E-government's growth can be strengthened by the use of wireless systems in what is described as mobile or m-government. Also, e-government 2.0 is becoming increasingly popular with tools such as wikis, blogs, social networks, and Twitter.
3. **E-learning and training.** E-learning is the delivery of educational content through electronic media via the Internet and intranets. Degree programs, lifelong learning topics, and corporate training are delivered online by thousands of organizations worldwide. A growing area is distance learning via online university offerings, and virtual universities are becoming quite popular. Some are virtual; others are delivered as a combination of online and off-line offerings. Online corporate training is also increasing, and is sometimes conducted at formal corporate learning centers. Implementation is done in steps starting with just an online presence and ending with activities on social networks. New e-readers contain easy-to-read text, search capabilities, rich media, as well as other functions. Add to this the low cost of e-books and the capability of storing hundreds of books on a single e-reader, and you can understand the increased popularity of these devices.
4. **E-books and their readers.** There is an increased interest in e-books due to their many benefits (Amazon.com sells more e-books than hardcover ones). There is intense competition among e-readers and tablet manufacturers, and the products' capabilities are increasing while their prices are declining. E-books are used both for pleasure reading and for studying. E-books can be read on several portable devices, including tablets.

5. **Knowledge management and dissemination.** Knowledge has been recognized as an important organizational asset. It needs to be properly captured, stored, updated, and shared. Knowledge is critical for many e-commerce tasks. Knowledge can be shared in different ways; experts can provide knowledge to nonexperts (for a fee or free) via a knowledge portal, e-mail, or chatting and discussion tools, and through social networks (e.g., via user-generated videos or text).
6. **Online advisory systems.** Online advisory systems of all kinds are becoming popular. Some are free although most charge fees. Users must be careful about the quality of the advice they receive. Social networks and portals provide a variety of advisory services of different qualities.
7. **E-health.** E-commerce, m-commerce, and social commerce applications are increasingly penetrating the health care field. Practically, B2B, B2C, c-commerce, and even P2P services are practiced all over the world. The most well known is the electronic medical records area that helps in rapid care and accessibility in rural areas. Another well-known area is patient care applications ranging from monitoring patients 24/7 to improving medical testing, enabling the use of better medical equipment and increasing patients' satisfaction and comfort. Patients' education is greatly facilitated by using medical portals. Physicians have rapid access to all data they need and they can transmit orders electronically.
- Social media and networks assist patients and administrators in many ways and foster sharing and collaboration. Other areas that benefit from e-commerce are medical services acquisition, maintenance, and use. Many administrative processes and medical research are supported by EC. However, a major problem in e-health is the protection of patients' medical records and privacy.
8. **C2C activities.** C2C consists of individual consumers conducting e-commerce with other individual consumers, mainly in auctions (such as at eBay), classified ads, matching services, specialty webstores at Amazon.com, and file sharing.

---

## KEY TERMS

Automated question–answer (QA) system  
 Consumer-to-consumer (C2C) EC  
 Distance learning  
 E-government  
 E-health  
 E-learning  
 Electronic book (e-book)  
 Expert/expertise location systems (ELS)  
 Government 2.0  
 Government-to-business (G2B)  
 Government-to-citizens (G2C)  
 Government-to-employees (G2E)

Government-to-government (G2G)  
 Knowledge management (KM)  
 Learning management system (LMS)  
 Mobile government (m-government)  
 M-learning (mobile learning)  
 Social learning (e-learning 2.0)  
 Virtual universities

---

## DISCUSSION QUESTIONS

1. Discuss the advantages and disadvantages of e-government using social networking versus the traditional e-government portal.
2. Discuss the advantages and shortcomings of e-voting.
3. Discuss the advantages and disadvantages of e-books.
4. Discuss the advantages of e-learning in the corporate training environment.
5. In what ways does KM support e-commerce?
6. Some say that B2G is simply B2B. Explain.
7. Compare and contrast B2E with G2E.
8. Which e-government EC activities are intrabusiness activities? Explain why they are categorized as intrabusiness.
9. Identify the benefits of G2C to citizens and to governments.
10. Relate IBM's Jams to KM and social networks.
11. Relate KM to learning, to e-publishing, and to C2C.
12. Discuss the development of e-health.

---

## TOPICS FOR CLASS DISCUSSION AND DEBATES

1. Discuss the advantages and disadvantages of e-learning for an undergraduate student and for an MBA student.
2. Discuss the advantages of expert/expertise location systems over corporate databases that contain experts' information and knowledge. What are the disadvantages? Can expert location systems and corporate databases be combined? How?
3. One of the major initiatives of many governments (e.g., European Commission) is Smart Cities (see Chapter 6 for the technology). Discuss the content of such initiatives and explain why they are a part of e-government.
4. Debate: E-books will replace traditional books.
5. Debate: Why aren't all firms embracing KM?
6. Debate: Analyze the pros and cons of electronic voting.
7. Enter [en.wikipedia.org/wiki/E-Government](http://en.wikipedia.org/wiki/E-Government) and find the "controversies of e-government" section. Discuss the advantages and disadvantages. Write a report.
8. Debate the issue: Is e-learning really working?
9. Discuss the content and benefits of the UNE-Government Development Database ([unpan3.un.org/egovkb](http://unpan3.un.org/egovkb)).
10. Debate the issue of electronic vs. manual voting.

## INTERNET EXERCISES

1. Enter [e-learningcentre.co.uk](http://e-learningcentre.co.uk), [elearnmag.acm.org](http://elearnmag.acm.org), and [elearningpost.com](http://elearningpost.com). Identify current discussion issues and find two articles related to the effectiveness of e-training. Write a report. Also prepare a list of the resources available on these sites.
2. Enter [adobe.com](http://adobe.com) and find the tutorials and tools it offers for e-learning, knowledge management, and online publishing. Prepare and give a presentation on your findings.
3. Identify a difficult business problem in your or another organization. Post the problem on [elance.com](http://elance.com), [linkedin.com](http://linkedin.com), [answers.yahoo.com](http://answers.yahoo.com), and [answers.com](http://answers.com). Summarize the information you received to solve the problem.
4. Enter [blackboard.com](http://blackboard.com) and also view [en.wikipedia.org/wiki/Blackboard\\_Inc](http://en.wikipedia.org/wiki/Blackboard_Inc). Find the major services provided by the company, including its community system. Write a report.
5. Enter [fcw.com](http://fcw.com) and read the latest news on e-government. Identify initiatives not covered in this chapter. Then enter [gcn.com](http://gcn.com). Finally, enter [egovstrategies.com](http://egovstrategies.com). Compare the information presented on the three websites.
6. Enter [procurement.org](http://procurement.org) and [govexec.com](http://govexec.com). Identify recent e-government procurement initiatives and summarize their unique aspects.
7. Enter [hivemine.com](http://hivemine.com) and look at their products, solutions, news, and blogs. Do you agree with the company's motto: "Socialize your knowledge and thrive?" Explain your answer.
8. Enter [amazon.com](http://amazon.com), [barnesandnoble.com](http://barnesandnoble.com), and [sony.com](http://sony.com) and find the latest information about their e-readers. Compare their capabilities and write a report. (Consult the [ebook-reader.com](http://ebook-reader.com).)
9. Enter [mindjet.com](http://mindjet.com). Find out how collaboration is supported there. Summarize the benefits of the site to the participants.
10. Enter [chegg.com](http://chegg.com) and similar sites that do learning platforms. Explain what they do.
11. Enter [guru.com](http://guru.com) and [elance.com](http://elance.com) and compare their offerings. Which one would you prefer to post your skills on and why?
12. Find two companies that enable C2C (or P2P) e-commerce (such as [egrovesys.com](http://egrovesys.com)). Comment on their capabilities.
13. The U.S. government opened a virtual embassy in Iran. Find information about the service and the reaction of the Iranian government. Write a report.

## TEAM ASSIGNMENTS AND PROJECTS

1. **Assignment for the Opening Case**  
Read the opening case and answer the following questions.
  - (a) What were the primary and secondary problems that Compass Group faced with training its managers?
  - (b) How did the company overcome the skeptics of e-training?
  - (c) How did the company approach the complexity of systems training?
  - (d) What were the outcomes of the new e-training?
  - (e) In your opinion, what are the most important aspects in e-training implementation?
2. New York City is known for its extensive e-government initiatives that were sponsored by Mayor Bloomberg between 2002 and 2013. Find information about these initiatives, their benefits to the public, and their fate after Bloomberg completed his term. Each team will concentrate on one area. Write a report.
3. Create four teams, each representing one of the following: G2C, G2B, G2E, and G2G. Each team will prepare a description of the activities in the assigned area (e.g., G2C) in a small country, such as Holland, Denmark, Finland, or Singapore. A fifth team will deal with the coordination and collaboration of all e-government activities in each of the four countries chosen. Prepare a report.
4. Read Gartner's "10 Tech Trends for Smart Government" (2014) at [enterpriseinnovation.net/article/10-tech-trends-smart-government-759893589](http://enterpriseinnovation.net/article/10-tech-trends-smart-government-759893589). Find newer trends. Explore each of the trends and find examples of how government deals with these trends. Compare to findings of the UN E-Government survey of 2016. Prepare a class presentation.
5. View the video "E-Learning Debate 2010 - Highlights" (4:51 min) at [youtube.com/watch?v=Q42f1blFnc](http://youtube.com/watch?v=Q42f1blFnc). Debate the pros and cons regarding the value of e-learning.
  - (a) List all the pro and con statements from the video.
  - (b) For each statement, have two teams (or individuals) explain why each agrees or disagrees with the statement.
  - (c) Add several pro and con statements from what you learned in class or discovered on the Web.
  - (d) For each added statement, have two teams (or individuals) explain why each agrees or disagrees with the statement.
  - (e) Jointly prepare a summary. The use of a wiki is advisable.
6. Have each team represent one of the following sites: [netlibrary.net](http://netlibrary.net) and [ebooks.com](http://ebooks.com). Each team will examine

the technology, legal issues, prices, and business alliances associated with its site. Each team will then prepare a report answering the question, “Will e-books succeed?” (Read Nuwer 2016).

- Each team is assigned a question-and-answer company (e.g., [answers.com](http://answers.com), [ask.com](http://ask.com)). Check the company’s offerings, including social networking/games. Present your findings.

---

## CLOSING CASE: HENRY FORD HEALTH SYSTEM PROVIDES SUPERIOR PATIENT EXPERIENCE USING IT AND E-COMMERCE

Henry Ford Health System (HFHS) is a comprehensive health system that provides care to 2.2 million patients annually in Metro Detroit and several other cities. The HFHS complex includes five medical centers and 24,000 employees.

### The Challenges

The system’s mission is to support the communication and collaboration of the mobile employees, patients, insurers, physicians, visitors and vendors, and to assure the operation of the many mobile biomedical devices. HFHS needed a massive electronic network. Furthermore, it was necessary to support the patient data flow, some of which is in real time (data accessibility at point of care). All this required continued availability with protection of privacy and security. The challenges include the support of a multitude of mobile devices that patients and visitors bring with them. In addition, the mobile and biomedical devices are from many manufacturers and are used for many applications (e.g., X-ray carts, IV pumps, mobile ultrasound, and EKG machines). Parts of the medical facilities are within six foot concrete walls which made radio frequency (RF) penetration difficult. The hospital needed a wall-to-wall coverage by wireless connection that would work without interferences and enable a large volume of wireless traffic.

### The Solution

HFHS decided to install an advanced Wi-Fi system. This required experimentation with different software and hardware and with the locations and numbers of Wi-Fi access points.

The resultant solution enabled the integration of over 3500 biomedical devices into the Wi-Fi network. This required collaboration with those that are purchasing the devices. To support the wireless, it was necessary to bring access point antennas in over 90 elevators and many stairway

corridors (a multiple year project). The solution also included penetration of information flow in lead walls and through six foot concrete shelters. In addition, the solution enabled connecting with the many brands of mobile devices belonging to patients and visitors. The system covers over 60 sites of HFHS in many locations. Overall, more than seven million square feet of facilities are covered. In 2016, there were over 3200 access points and 1200 security sensors. In addition to the Wi-Fi, the HFHS is using several e-commerce information systems such as Philips’ CareSage predictive analytics and 3M 360 Encompass system.

### The Results

The success of Wi-Fi was featured in a best practice article in the “Association for the Advancement of Medical Instrumentation.” Patient satisfaction has increased drastically and so has the productivity and quality of the hospital’s employees and the physicians. The networks also enable members of the community to access the educational material disseminated by the hospital. The Wi-Fi enables the biomedical devices to operate smoothly, to enable safe access to all needed information, and to facilitate communication, collaboration, and team work. All these were done while meeting all compliance requirements.

**Sources:** Based on Extreme Networks (2015) and Philips Electronics PHG Company (2016).

### Questions

- Why was Wi-Fi the only reasonable solution?
- Why was this project so complex?
- What are the major benefits? To whom?

---

## ONLINE FILES

Available at [ecommerce-introduction-textbook.com](http://ecommerce-introduction-textbook.com)

- W5.1 E-Government Social Media Activities in New Zealand
- W5.2 The Stages of E-Government Transformation
- W5.3 Application Case: Knowledge Sharing as a Strategic Asset at Caterpillar Inc.

---

## REFERENCES

- Behr, A. “MocaCare’s Latest Health Monitor tracks Blood Pressure, Oxygen Levels.” *eWeek*, February 8, 2016.
- Britt, P. “E-Commerce Buys into KM.” October 2013. [kmworld.com/Articles/Editorial/Features/E-commerce-buys-into-KM-92023.aspx](http://kmworld.com/Articles/Editorial/Features/E-commerce-buys-into-KM-92023.aspx) (accessed March 2016).
- Brown, A., J. Fishenden, and M. Thompson. *Digitizing Government: Understanding and Implementing New Digital Business Models*

- (*Business in the Digital Economy*). New York, NY: Palgrave Macmillan, 2014.
- Chan, C. M. L., R. Hackney, S. L. Pan, and T. C. Chou. "Managing e-Government System Implementation: A Resource Enactment Perspective." *European Journal of Information Systems*, vol. 20, 2011.
- City & Guilds Kineo. "Compass Group Systems Training." 2011. [kineo.com/case-studies/process-and-technical/compass-group-systems-training](http://kineo.com/case-studies/process-and-technical/compass-group-systems-training) (accessed March 2016).
- Clark, R. C., and R. E. Mayer. *e-Learning and the Science of Instruction*, 4<sup>th</sup> ed. San Francisco: Pfeiffer/Wiley & Sons, 2016.
- Combs, C.D., J. A. Sokolowski, and C. M. Banks. *The Digital Patient: Advancing Healthcare, Research, and Education*. (Wiley Series in Modelling and Simulation) Hoboken, NJ: Wiley, 2016.
- Cunningham, S. "Peer to Peer Lending Sites: an Exhaustive Review." *Lending Memo*, May 8, 2015. [lendingmemo.com/p2p-lending-sites](http://lendingmemo.com/p2p-lending-sites) (accessed May 2016).
- Demaitre, E. "Top Robotics Transactions of 2015" *Robotics Business Review*, December 31, 2015.
- Digital Government Strategy. "Building a 21st Century Platform to better serve the American People." A Whitehouse Report, 2012. [whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html](http://whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html) (accessed April 2016).
- Dodge, J. "Artificial Intelligence in the Enterprise: It's On." *Computer World*, February 10, 2016.
- Editors. "Robotics Solutions Could Transform Pediatric Patient Care Delivery." *Healthcare Innovation*, May 27, 2015.
- Egov. "E-Government Strategy: Implementing the President's Management Agenda for E-Government." April 2003. [sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga\\_055959.pdf](http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_055959.pdf) (accessed March 2016).
- Elton, J., and A. O'Riordan. *Healthcare Disrupted: Next Generation Business Models and Strategies*. Hoboken, NJ: Wiley, 2016.
- Estopace, E. "AI Personal Health Assistant Now on Global Messaging Services." *Enterprise Innovation*, February 2, 2016. [enterpriseinnovation.net/article/ai-personal-health-assistant-now-global-messaging-services-902506163](http://enterpriseinnovation.net/article/ai-personal-health-assistant-now-global-messaging-services-902506163) (accessed February 2016).
- Extreme Networks. "Case Study: Henry Ford Health System." *Extreme Networks Inc.*, 2015.
- Forbes. "Transforming Healthcare Using an E-Commerce Model." *Forbes*, August 28, 2014.
- Grogan, B. J. *33 Social Media Tips, Tricks & Shortcuts: Helping Digital Marketers in Government and Business Succeed*. Colorado Spring, CO: Van Sant Publishing LLC, 2015.
- Imholt, S. J. *User Guide to Government 2.0*. San Antonio, Texas: Top Wing Books, 2015.
- Insitesoft. "Medical and Healthcare Suppliers Have Big Growth Potential with eCommerce Websites." *Insitesoft*, October 20, 2015.
- Kaattari, J., and V. Trottier. *Guide to Effective Technologies for Online Learning* [Kindle Edition]. Ontario, Canada, Community Literacy of Ontario, 2012 (revised and updated October 2013).
- King, R. "Newest Workers for Lowe's: Robots." *The Wall Street Journal*, October 28, 2014.
- Lawson, G. W. *Healthcare Social Media: Transformation 3.0*. Seattle, WA: CreateSpace Inc., 2015.
- Madden, R. *Voting Fraud*. [Kindle Edition] New York: Guardian Press, 2015.
- Markoff, J. "Toyota Planning an Artificial Intelligence Research Center in California." *The New York Times*, November 6, 2015. [gilesmorgan.wordpress.com/2015/11/06/toyota-planning-an-artificial-intelligence-research-center-in-california-by-john-markoff](http://gilesmorgan.wordpress.com/2015/11/06/toyota-planning-an-artificial-intelligence-research-center-in-california-by-john-markoff) (accessed February 2016).
- Martin and Amy. "Peer to Peer Lending." *Money Saving Expert*, February 10, 2016.
- Mayo Clinic Center for Social Media. *Bringing the Social Media Revolution to Health Care*. Scottsdale, AZ: Mayo Foundation, 2012.
- Mei Hua, S. R. and I.K. Rohman. "Challenges in E-Government Implementation." *The Jakarta Post*, July 27, 2015.
- Millar, E. "No Classrooms and Lots of Technology: A Danish School's Approach." June 20, 2013. [theglobeandmail.com/report-on-business/economy/canada-competes/no-classrooms-and-lots-of-technology-a-danish-schools-approach/article12688441](http://theglobeandmail.com/report-on-business/economy/canada-competes/no-classrooms-and-lots-of-technology-a-danish-schools-approach/article12688441) (accessed March 2016).
- Milton, N. and P. Lambe. *The Knowledge Manager's Handbook: A Step-by-Step Guide to Embedding Effective Knowledge Management in Your Organization*. London, UK: Kogan Page, 2016.
- Morin, J. *Infosys 94 Success Secrets – 94 Most Asked Questions On Infosys – What You Need To Know* [Kindle Edition]. Queensland, Australia: Emereo Publishing, 2014.
- Niccolai, J. "IBM Watson Will Know What You Did Last Summer." *PC World*, September 23, 2015.
- Nuwer, R. "If the Printed Word Become a Thing of the Past, It May Affect How We Think." *BBC.com*, January 25, 2016. [bbc.com/future/story/20160124-are-paper-books-really-disappearing](http://bbc.com/future/story/20160124-are-paper-books-really-disappearing) (accessed February 2016).
- Office of Management and Budget. "FY 2011 Report to Congress on the Implementation of the E-Government Act of 2002." March 7, 2012. [whitehouse.gov/sites/default/files/omb/assets/egov\\_docs/fy11\\_e-gov\\_act\\_report.pdf](http://whitehouse.gov/sites/default/files/omb/assets/egov_docs/fy11_e-gov_act_report.pdf) (accessed March 2016).
- Philips Electronics PHG Company. "Henry Ford Health System Is Eight U.S. Health System in Six Months Time to Adopt Philips Predictive Analytics Solution as Health System Seek to Identify At-Risk Elderly Patients at Home." *3M His*, February 9, 2016.
- Shark, A., and S. Toporkoff. *Beyond e-Government and e-Democracy: A Global Perspective*. Scotts Valley, CA: BookSurge Publishing, 2008.
- Silverman, R. E. "Bosses Harness Big Data to Predict which Workers Might Get Sick." *Dow Jones Business News*, February 16, 2016.
- Streitfeld, D. "Teacher Knows if You've Done the E-Reading." April 8, 2013. [nytimes.com/2013/04/09/technology/coursesmart-e-textbooks-track-students-progress-for-teachers.html?pagewanted=all&\\_r=0](http://nytimes.com/2013/04/09/technology/coursesmart-e-textbooks-track-students-progress-for-teachers.html?pagewanted=all&_r=0) (accessed March 2016).
- Taft, D. K. "Putting IBM's Watson Analytics to Work-From Law to Universities." *eWeek*, February 12, 2016.
- Thompson, K., "Managers of E-Learning Project Tout Positive Results." February 13, 2014. [jamaicaobserver.com/news/Managers-of-e-learning-project-tout-positive-results\\_16006381](http://jamaicaobserver.com/news/Managers-of-e-learning-project-tout-positive-results_16006381) (accessed March 2016).
- Training Press Releases. "Kineo and Compass Group Create Award-Shortlisted Systems Training E-Learning." October 26, 2011. [trainingpressreleases.com/news/kineo/2011/kineo-and-compass-group-create-award-shortlisted-systems-training-e-learning-](http://trainingpressreleases.com/news/kineo/2011/kineo-and-compass-group-create-award-shortlisted-systems-training-e-learning-) (accessed March 2016).
- Vaughan-Nichols, S. J. "Good-Bye Books, Hello E-Books." December 27, 2012. [zdnet.com/good-bye-books-hello-e-books-7000009208](http://zdnet.com/good-bye-books-hello-e-books-7000009208) (accessed March 2016).
- Wachter, R. *The Digital Doctor: Hope, Hype, and Harm at the Dawn of Medicine's Computer Age*. NY: Mc Graw-Hill, 2015.
- Wohlers, T. E. and L. L. Bernier. *Setting Sail into the Age of Digital Local Government: Trends and Best Practices (Public Administration and Information Technology)*. NY: Springer, 2016.